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VOLUME VIII SEPTEMBER, 1915 NUMBER 9

Southern Medical Journal

Journal of The Southern Medical Association

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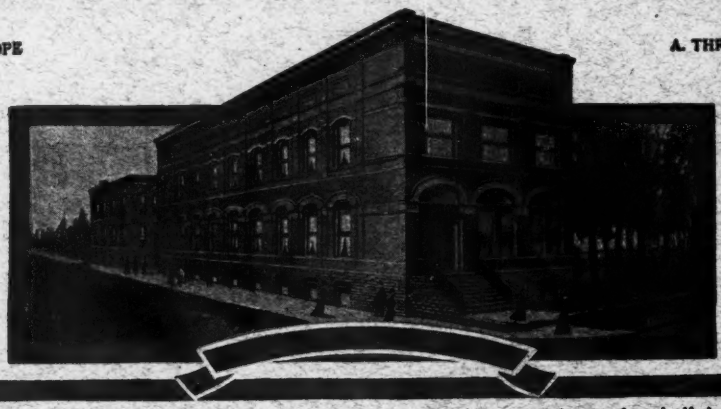

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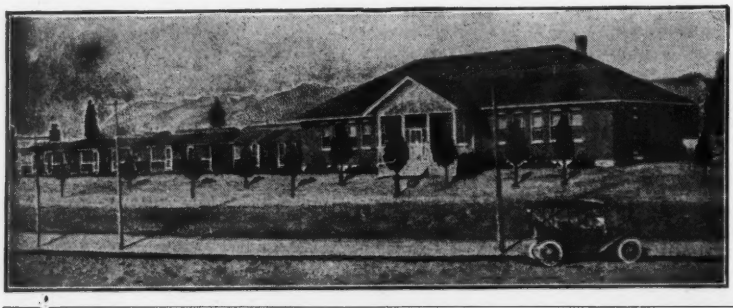

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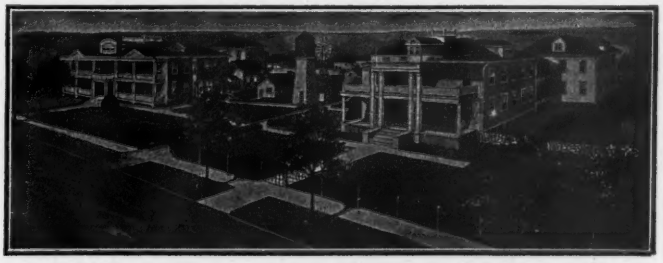

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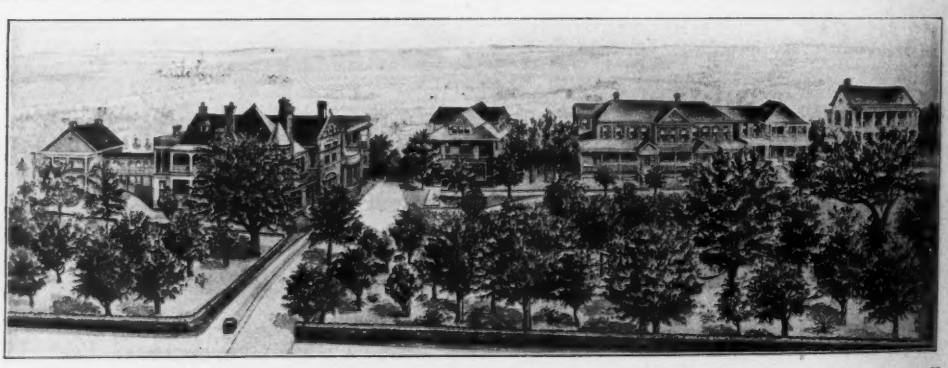

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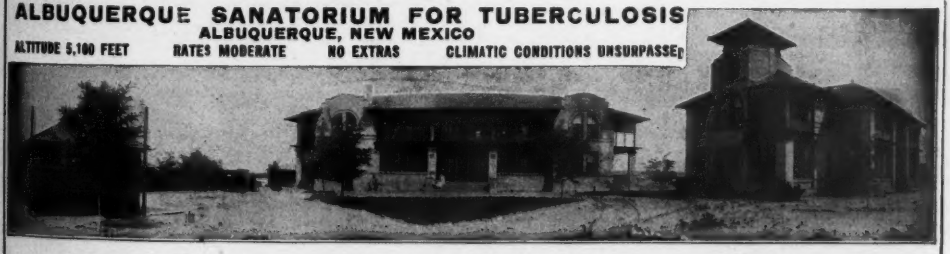

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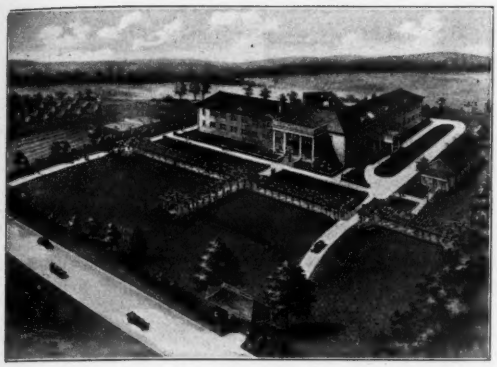

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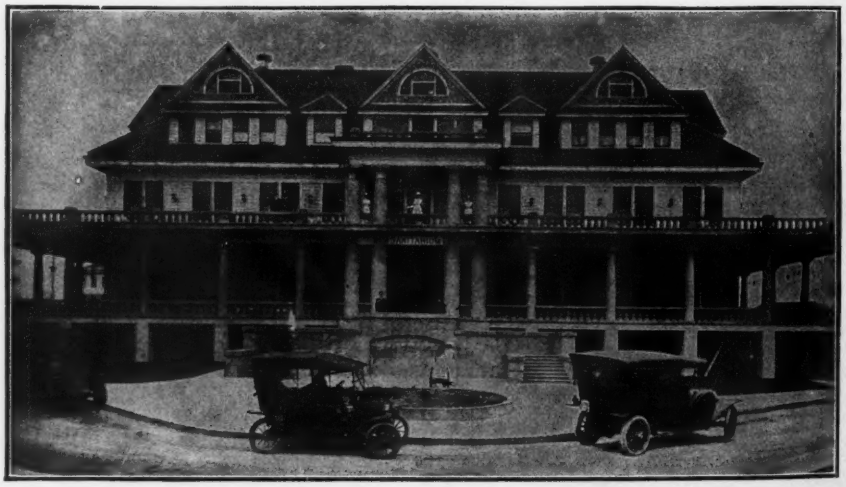

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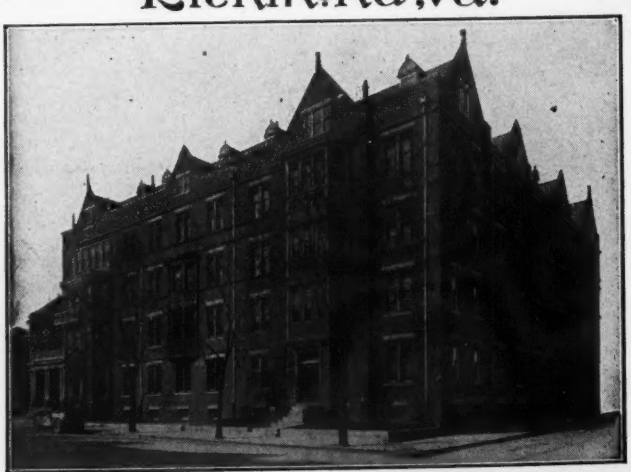

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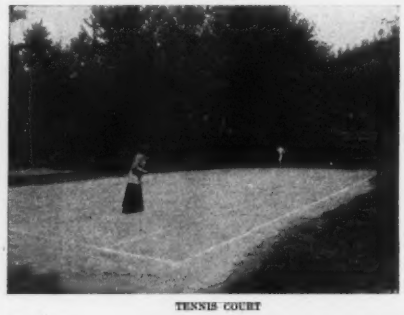

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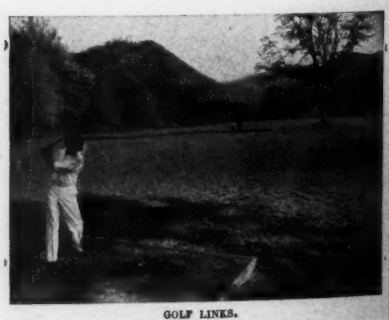

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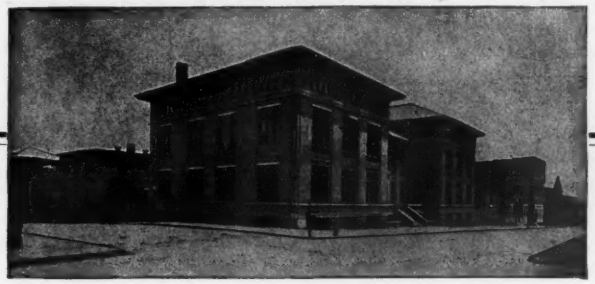

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SOUTHERN MEDICAL JOURNAL

JOURNAL OF THE SOUTHERN MEDICAL ASSOCIATION

PUBLISHED MONTHLY

Editorial and Business Offices: Birmingham, Alabama Publication Office: Nashville, Tennessee
Address all communications to Birmingham Office

Volume VIII SEPTEMBER 1, 1915 Number 9

TROPICAL DISEASES AND PUBLIC HEALTH

DIAGNOSIS IN HOOKWORM DISEASE.*

By J. La Bruce Ward, M.D.
Columbia, S. C.

No one conversant with the facts concerning the prevalence of this disease in the Southern states, and its nature, will deny that from an economic standpoint it ranks with malaria, typhoid fever and tuberculosis. In many parts of the South it constitutes a more serious problem than does any other disease. While the death rate from this disease is not high, the victim falls an easy prey to other diseases (notably tuberculosis and pellagra), from which he would otherwise have recovered. Aside from this, it causes *per se* an immense amount of invalidism, resulting in a loss of efficiency, physically and mentally, which is incalculable. Owing to the extensive work done by the Rockefeller Sanitary Commission through the boards of health in eleven Southern states, much of the skepticism concerning this, which characterized the medical profession as well as the laity, a few years since, has disappeared.

During the three years ending January, 1914, a microscopic examination of specimens from 700,000 persons showed an infection of 35 per cent. The highest percentage of infection for any state was 60, and the lowest 24. Taking into consideration only those of school age, living in rural districts, 43 per cent of 180,000 were found infected. In one state the infection was as high as 78 per cent, and the lowest infection was 32 per cent, while an attempt was made to examine all persons, regardless of whether or not symptoms of the disease were present, it must be admitted that the majority of those applying to the dispensaries for examination thought that they had the disease. On the other hand, a second examination would have discovered the presence of ova in the stools of many pronounced free from infection.

Despite the fact that several hundred thousand microscopic examinations have been made, and thousands of patients treated (resulting often in miraculous cures), the average physician practicing in rural communities fails to make a diagnosis of this disease. Why? Manson tells us that the secret of diagnosis in this, as in many other diseases, is to suspect its presence. Is this not only another way of saying that we see that which we know? This is the answer.

We as physicians are daily overlooking this most important disease, because we are not constantly on the lookout for it; that is, we do not suspect its presence. The more experience one has with it, the more reluctant one is to hazard a diagnosis on clinical symptoms. By the use of the microscope only can we prove an infection or rule it out, and yet how

*Read in Section on Public Health, Southern Medical Association, Eighth Annual Meeting, Richmond, Va., Nov. 9-12, 1914.

few physicians have such an examination made. Only recently the writer visited, with a consulting physician, a little patient who appeared moribund. More than a score of physicians had been called to see this patient, who was slowly dying, not from an incurable malady, but because the proper diagnosis had not been made. No attending physician, except the last, had even suspected a hookworm infection. The sufferer had doubtless been treated for everything except uncinariasis, and, as the old negro said, "was gettin' no better fast." This occurred in a city which does not lack medical men of ability; in a city situated in a state in which a most extensive and thorough campaign for the eradication of hookworm disease had been waged. If the first physician who saw that case had suspected hookworm disease, what suffering and sorrow would have been spared! Multiply this case by thousands and you have the reason why this paper is written. Nor is the busy practitioner the only one at whose door the blame should be placed. Many, if not most of our hospitals fail to include an examination of the feces in the routine examination, thus overlooking the presence of uncinaria and many other intestinal parasites which often constitute the principal and occasionally the sole cause of distress. An expulsion of the parasites would obviate the necessity for an operation, or at least increase the vitality of the patient and shorten convalescence. To illustrate:

A well-nourished patient showing no clinical evidence of hookworm disease applied for examination. Ova were present in the feces, and treatment resulted in marked improvement in a few weeks. This man had a short time previously spent two months in one of the best hospitals in the country, and after a thorough (?) examination was dismissed with the cheerful news that he had no organic disease, but was a neurasthenic.

Bass states that the combination of characteristic anemia, associated with underdevelopment, weakness, dilated heart and a history of ground itch, is not likely to be confounded with anything else. This is correct, but these symptoms, excepting "ground itch," are found in extreme cases only, and these are by no means in the majority. The reason why so many cases are now untreated is because we do not suspect the disease unless all of these marked symptoms are present. The sooner we cease to look for hookworm disease as something which can be diagnosed at a glance, the sooner will we use scientific methods of diagnosis. It is not unusual to find a patient who gives no history of ground itch, who shows no pallor, who has no dyspepsia, and yet who has numerous subjective symptoms, all of which promptly disappear after treatment. There is perhaps no other disease which is so insidious, or which has symptoms so numerous and so protean. A few of those most commonly found are, "ground itch," underdevelopment, pallor, cyanosis, edema, dry skin, gastric dilatation, indigestion, pains in head, chest and abdomen, fever, cough, capricious appetite, vertigo, palpitation, weariness and somnolence. The most striking symptoms in the advanced cases are pallor (or muddy complexion), underdevelopment and the peculiar facies. Subjectively, we have as the most frequent symptoms, indigestion, epigastric pain, weakness and dyspnea on slight exertion. It will readily be seen, therefore, that this disease, when mild, displays no distress signals, and when severe, simulates many other diseases, from which only a thorough examination will differentiate it. In several instances the writer has known a diagnosis of tuberculosis pulmonalis to be made in patients who had lost flesh, were having fever and coughed rather frequently. There were no pulmonary lesions demonstrable, and a few doses of thymol caused all symptoms to disappear. Most advanced cases of the disease are diagnosed as "malaria," "kidney disease" (whatever that may mean) and "dropsy." While the last is a symptom of many diseases, this all-sufficient word covers a multitude of mistaken diagnoses. Ask the average physician why he suspects a certain patient of being

a hookworm subject, and you will be told that it is because of the pallor. This symptom being common to many diseases (notably malaria), is very deceptive. It is also a well-known fact that the color of the skin affords no clue to the hemoglobin percentage in many instances. This is particularly true of cotton mill operatives, whose complexion would lead the uniniated to suspect hookworm infection in at least 75 per cent of the cases, whereas, the infection is lighter than among the same class of people who live in rural districts, and whose general appearance is better. In other words, it may be that the anemia is apparent only, and would be borne out by a blood examination. Sahli remarks that such a condition is often due to reduction in the blood pressure or to disturbance of the vasomotor system. Pallor of the lips is often transitory, and seldom from organic disease. The edema, especially of the face, is present in the majority of severe cases, but is of course not peculiar to this disease. When malaria is suspected a diagnosis of the blood should, of course, be made. In short a diagnosis is impossible without a microscopic examination of the feces. This procedure is so simple that any one can master it in a few hours. The appearance of the ova is so characteristic that no confusion is probable. After becoming familiar with their appearance it is an easy matter to find the ova in the feces of an individual harboring any considerable number of parasites. This rule, like all others, has exceptions. In some instances where worms are present and clinical symptoms marked, no ova are found. As an explanation of this it has been suggested that most of the parasites were the males, or that owing to the effect of certain food or drugs, the females had ceased to ovulate. The mode of examination is as follows:

A half dram of feces is ample unless the centrifuge is used, in which case two drams will be required. The formed feces is better than a liquid stool, because in the latter the eggs tend to settle to the bottom of the container. It is desirable to use slides 2x3 inches. Thus there is a larger area for examination, and the stage of the instrument is not so likely to be soiled. In the center of the slide place three drops of water, and on the point of a toothpick place on this a piece of fecal matter about the size of a match head. Stir to a uniform consistency and spread evenly over the slide, leaving a clear margin entirely around its border. The examiner will soon learn how to get the smear of the proper thickness. It is not necessary to use a cover glass, but the specimen should not be examined after it has dried out. The 2-3 objective and 1-inch eye piece will give sufficient magnification. After a little practice a slide can be thoroughly examined in a few minutes. Where a patient has a moderate infection an examination of four or five slides will suffice to find the ova. Often numerous eggs are found in the first field, but it is better to examine a few slides in order to search for the ova of other intestinal parasites. A mechanical stage is not necessary, but it enables the beginner to search in a more systematic manner. When only a few ova are contained in the stools, or where greater accuracy is desired, the centrifuge may be used to advantage. The feces should be mixed with ten times its bulk of water. Strain this through three layers of gauze to remove coarse particles. It will require from a few seconds to a few minutes to centrifuge sufficiently to throw the eggs down. Pour off the fluid in the upper two-thirds of the tube, refill and centrifuge again. Repeat this, then remove the sediment with a pipette and spread a few drops on a slide. The Bass method is even better than this, but rather troublesome for routine work. In cases where symptoms are marked and no ova are found after careful examinations, the patient may be given an anthelmintic, and the stool strained through a piece of cheese cloth. This will frequently reveal the presence of worms.

In conclusion it should be borne in mind: firstly, that hookworm disease is one of the most prevalent and most important diseases with which the physicians of the South have

to deal; secondly, that a reliable diagnosis can never be made without a microscopic examination, and that this does not always reveal the presence of ova; thirdly, that an examination of the feces should be included in the routine examination in every hospital, and fourthly, that the physicians practicing in the South should always suspect the presence of hookworm disease regardless of symptoms or their absence.

Before closing I wish to acknowledge that I have drawn freely from Dock and Bass on "Hookworm Disease" and from the report of the Porto Rico Anemia Commission.

DISCUSSION.

Dr. C. W. Stiles, U. S. P. H. S., Wilmington, N. C.: Dr. Ward has brought up a very interesting point, namely, in how far do the Southern physicians recognize hookworm disease after all the campaign that is going on. I would like to add one other thought, namely, in how far are they interested after they do recognize it. Let me recall three cases that have come under my observation within the last few weeks. First, a county seat, in which there were three physicians all thoroughly familiar with hookworm disease, all thoroughly aware of the fact that a certain family there was infected from the father down. I tried to get these physicians to treat that family. I finally took the family down to Wilmington, N. C., and had them treated. Second, another county seat, thirty-two practicing physicians in the town. A patient was there and practically dying. Every practicing physician with the exception of three in the city is said to have seen that patient, and not one of them had made a diagnosis. The child was almost dying. That was in the past month. The third instance was not at a county seat, but in one of those unfortunate places in the South where families are dependent for their medical service upon the system of "contract practice." The physician in the case had thoroughly recognized that a certain family is shot through and through with hookworm disease. I tried to get the physician to treat the children. His reply has been that as soon as the children got a little better he would treat them. Finally I took the patients to the hospial and treated them. A lot of work has been done on hookworm disease. The average Southern physician today is not interested in the subject. He does not make a diagnosis, and when he does make a diagnosis he does not treat the patient. It is discouraging to work from year to year on a disease so easy to recognize, so easy to treat, and then see the cases absolutely ignored even when recognized, see those cases treated time and time again, week in and week out, not for the cause that produces the symptoms, but for the symptoms. In my experience within the past six weeks I could point to you a number of cases being treated in North Carolina for heart disease, the physician in the case being absolutely aware of the infection of hookworm.

Dr. Ward has brought up one point in regard to which there will always be a difference of opinion. I wrote it down: he said "reliable diagnosis in hookworm can not be made without the microscope." I do not really think Dr. Ward means that. I will agree to make a reliable symptomatic diagnosis and he will agree to make a reliable symptomatic diagnosis in hundreds and hundreds of cases that are typical. Of course, he would not do that if he were out of the area of infection, but in his district he would be perfectly safe in making a symptomatic diagnosis on symptoms in a number of cases. I certainly would in many cases. If I were going on record I would want to examine the cases microscopically from an academic point of view.

Dr. Smith's paper is intensely interesting. Dr. Rudolph Leuckart has shown that the question of age and, possibly, the question of sex are important factors in infection with certain nematodes. In view of the fact that infection of hookworm disease so commonly takes place through the feet, and the skin of the negro's foot is so thick, the question arises whether this is an important factor in decreasing the relative infection in the negro. It would be well to recall that some observers report a high percentage of infection among negroes of some districts, and on that account I would move to amend the title of Dr. Smith's exceedingly interesting paper and have it read "Relative Immunity of the Negro to Hookworm Disease."

Dr. Jas. A. Hayne, Columbia, S. C.: I now rise to defend the medical profession of South Carolina and other Southern states. There is an old Latin proverb which says "Sutor ne ultra crepidam." In other words: "the shoemaker should stick to his lasts." Why? Because the shoemaker's vision is limited by the lasts. Now, the physicians of South Carolina are not theorists, whatever you choose to call them. They have to deal with diseases that kill. Hookworm does not kill in South Carolina. At least I have never had a case reported of death during the nineteen years I have practiced medicine. It does produce certain anemias and lack of efficiency in the people affected by it. Those are problems that ordinary physicians do not have to deal with. What they have to deal with is acute diseases that will produce death. When the work was first done in South Carolina it was done somewhat in this manner, and it caused a great deal of criticism and comment among the physicians. The young, recent graduates in medicine employed by the Rockefeller Commission, took from one to two hundred people, lined them up against the wall and said: "You have got it." "You have got it" made what Dr. Stiles calls a clinical diagnosis. Physicians who had been practicing for fifteen years refused to believe in this diagnosis which said, "You have got it," or "You have not got it;" they took specimens and sent them to our laboratory. Some that the Rockefeller physicians said did have the disease, did not have it, and some they said did not have the disease, had it. The physicians could not get around this fact. That is the reason the physicians of South Carolina have been exceed-

ingly conservative. The physicians do not deny that there is plenty of hookworm disease present. They will not submit to slipshod diagnosis. They insist upon microscopic proof. I would like to ask, just as a matter of information, whether Dr. Stiles would look at a patient and say whether he had heart disease, or Bright's disease, without further examination, Oedema is very common in both, and without microscopic findings I would not personally make a diagnosis between the two. Consequently, I do not believe he can make a differential diagnosis between anemia and hookworm.

Dr. John A. Ferrell, Washington, D. C.: These papers by Drs. Smith and Ward are most interesting. Dr. Strosnider, while a field director in North Carolina, made a comparative study of the prevalence of hookworm infection among the white and colored school children in Wayne county, North Carolina. Something like two thousand children were examined—approximately an equal number from each race. He found that in school districts where the infection was high among the whites it was correspondingly high among the blacks; but as a rule the infection among the negroes occurred less than half as frequently as among the whites.

Referring to the discussion as to the advisability of requiring microscopic examinations in the diagnosis of hookworm disease, I would say that our experience in the South leads us to the conclusion that the microscope alone should be relied upon. In 1911, when dispensary work began, a North Carolina field director was attempting to make clinical examinations in Columbus county. A local physician, who was equipped with a microscope, entered bitter protest, stating that when he called for specimens his patients frequently wanted to know why he was not as competent to make clinical examinations as the doctor representing the State Board of Health. Feeling that we could not afford to advocate loose or haphazard methods in doing demonstrative work, we subsequently discontinued any attempt to make clinical examinations and required a microscopic examination as the basis of diagnosis in every case. The staff of each state, who have probably had the largest experience with hookworm disease, have all come to this conclusion. I am therefore in accord with the views expressed by the authors of the respective papers on these subjects.

Dr. S. D. Porter, New Orleans, La.: Dr. Ward's paper on the diagnosis of hookworm disease enumerates the clinical symptoms very clearly. I agree with Dr. Hayne as to the necessity of the microscope in examination. We have a great many very mild cases of infection that give us very few physical findings and in those cases the microscope is absolutely necessary in arriving at a diagnosis. When the campaign against hookworm in Louisiana was first instituted we followed the method designated by Dr. Hayne.

We examined two hundred or more school children between the ages of 16 and 18, and according to that method. With the microscope as a basis of diagnosis we found some discrepancies. In three counties in which I conducted a second campaign I found in one of the counties I had underestimated the infection, whereas in one I had overestimated it. This shows the difference between clinical and microscopic diagnosis. I don't think a diagnosis should be made except in the severely infected cases that a blind man almost could see, without the microscope. On January 1, 1912, we adopted the microscopic method of making examinations.

I would like to impress this one fact upon this body, that is, no physical examination should be considered complete in a hookworm infected territory without a fecal examination. In communities surveyed where the hookworm infection was light, we found the infection from other intestinal parasites heavy; in one part of our state 952 microscopic examinations were made, and 52 per cent found infected, and many of the cases presenting the same symptoms as hookworm disease.

Dr. Smith's paper was very interesting. Concerning the degree of infection among the negroes, my finding is that it is not as great as among the whites.

Dr. J. L. Jelks, Memphis, Tenn.: If you want to do some good right here and now, let one of these gentlemen who is teaching hookworm disease tell how to obtain, how to prepare and how to examine a stool for hookworm disease. Can any one doubt, and I am among men who have small laboratories or no laboratories at all, can any one doubt my statement when I tell you there is not one doctor in twenty-five in the South who knows how to find hookworm, and, gentlemen, I am not belittling our profession. We want to do what is right, we want to find what is the matter with our children. Any man going round saying "You have it," or "You haven't it," I don't agree with. Will some one in just as few words as he can tell a doctor how to make a diagnosis?

Dr. W. A. Brumfield, Lynchburg, Va.: In this state all of our diagnoses are made by the microscope. I never report a case of any kind without making a microscopic examination. I don't believe that in the average country practice in this state a physician would be justified in keeping a microscope because the Board of Health will make all his examinations for him. If they are not going to do that they would have to go to some laboratory and learn how to make examinations.

I want to take issue with Dr. Hayne about hookworm not being fatal. I have been called on in a number of cases in which a fatal prognosis had been made. I have had at least two cases of that kind. I believe that the prognosis was correct if a timely correct diagnosis of hookworm had not been made and treatment given, but if either of these patients had died, the death would not have been reported as due to hookworm disease, as one case was called broncho-pneumonia and the other tuberculosis.

Dr. W. A. Plecker, Richmond, Va.: I want to speak with reference to the absence of fatality. A number of certificates have come to our office with record of death from hookworm disease. A number of deaths occur in Virginia from hookworm disease. Four or five deaths were reported last year from that cause. In case of one woman in labor who was badly infected with hookworm disease, she simply did not have the strength to give birth to the child and died really from hookworm disease, though it was classed as a death

from childbirth. She refused to take treatment. Said she could not swallow the capsules and died without treatment. We do have deaths from hookworm.

I have found cases diagnosed as tuberculosis, typhoid fever, heart disease, eight or ten different diseases which proved on diagnosis to be uncinariasis, and for which accurate diagnosis had not been made.

Dr. W. E. Vest, Meherrin, Va.: Dr. Stiles' indictment of the members of the medical profession in the South is too broad. My experience has been that there are many patients who will not take the hookworm treatment. During the state survey of Prince Edward county I saw this happen repeatedly. Moreover, in many cases where the first treatment was taken, the second and third were refused. I have had several similar experiences in my own private practice. I hope some one can tell us how to get these patients to take thymol.

Dr. Ward closes: I have not very much to say. Dr. Vest is correct; the physicians are not to blame because they don't catch the patients and pour thymol down them through a funnel. What I do blame them for is not attempting to make a diagnosis. The physicians fail to diagnose correctly. You can not make a reliable diagnosis in this disease without the microscope. Aside from this fact there are a great many other intestinal parasites besides hookworms. We pay too little attention to that fact. I recall a case where the patient, a young woman, showed marked abdominal symptoms, apparently demanding surgical interference. An examination of the feces showed ascaris infection. An anthelmintic was administered, thirty ascarides were expelled and all symptoms disappeared.

I will agree that we made a great mistake in South Carolina (the same mistake that was made in many other states), in attempting to make clinical diagnoses. We thought that we could thus diagnose the disease in most cases. We now know that we can not do this clinically. At first it was impossible to get patients to bring specimens of feces for examination. Therefore, it was necessary to diagnose clinically and treat a number of cases in order to arouse interest among the people, so as to get them to bring in specimens.

In regard to Dr. Hayne's statement that he had never seen hookworm disease put on a death certificate as the cause of death, I wish to reply by saying that Dr. Hayne made the statement in this section only yesterday that we had no vital statistics in South Carolina.

Dr. Jas. A. Hayne: We have had vital statistics in Charleston since 1760.

Dr. Ward: That is for the city only. Now, gentlemen, you all must realize that hookworm disease is a disease of rural districts, not of cities. Dr. Lynch, of the Medical College of the State of South Carolina (situated in Charleston), asked me only yesterday why it was that no hookworms were found in the bodies used in the dissecting room at the college. I told him that it was because they used adult negroes, most of whom had lived in the city.

In regard to physicians using microscopes, I wish to say that it is not necessary for them to do their own microscopic work in South Carolina, because the State Board of Health does that work. In spite of this fact, we don't get on an average five specimens a day of feces for examination. Physicians from all of the Southern states are treating malaria on less clinical evidence than is given by hookworm disease. We need to use the microscope in all diseases—let the physicians get the habit of doing it. If they have no microscopes or do not understand how to use them, send the specimens to the State Board of Health, where they will be carefully examined.

Now as to the technique of the examination, I purposely omitted reading this, but it is included in my paper and will appear in the Journal. For this you may refer to Dock and Bass' Hookworm Disease. A physician requested me to examine a specimen of feces, as he had failed to find any ova. I requested him to make the examination and saw him using the oil immersion lens. Dr. Jelks is correct; few physicians know how to make these examinations. In such cases they should send specimens to the Board of Health.

MEMORANDA FROM MALARIAL SURVEYS AND DEMONSTRATION WORK.

By Henry R. Carter, M.D.
Asst. Surgeon General at Large, U. S. P. H. S., Baltimore, Md.

These two memoranda of observations made during malarial work last summer may be of interest to those engaged in anti-malarial work in the South.

I. SAWDUST AS A MATERIAL FOR FILLING.

At Electric Mills, Miss., a sawmill village in the "flat-woods," the condition was this: The surface was flat, the ground was impervious to water, and there were many shallow depressions and much hauling. When one road became full of holes and ruts it was abandoned and another one made close by. The result was that in addition to the natural depressions holding water there were many holes and deep ruts holding water until it evaporated and breeding anopheles in the abandoned roads. There was nowhere to drain these to and filling with earth was not satisfactory: (1) It was expensive; (2) unless one took much pains and had considerable judgment he left

a hole wherever he got his filling, and (3) if the filled road was used again the newly placed earth would give way and the road soon become as bad as ever and hence again abandoned and breeding. We advised filling with sawdust and bark trash. The material was abundant and in the way. A load was much larger in cubic contents than a load of earth, and hence went further and was on both counts much cheaper than dirt for holes close to the sawmill. It left no hole when taken from the pile and made a fairly permanent fill, as driving over it did not displace it or make holes or ruts in it—its elasticity preventing.

Also, as we found that the stream of water receiving the drainage from the large sawdust pile did not breed mosquitoes for a long ways down, we believed that, at first at any rate, the water that might stand on or around the sawdust fill would not be suited for breeding anopheles. Economic and mechanical features were, however, the principal factors. The results were good and will, I believe, be practically permanent.

The writer has quite frequently seen places where the use of sawdust and mill waste for this purpose was the only feasible method of remedying conditions of mosquito breeding. For instance, at New Bern, N. C., there were, in 1913, two extensive depressions, Duffy's Field and Richardson's Pond, breeding anopheles profusely, which it was stated could not be drained, being too close to tide level. There was practically no earth available for filling, the city being low and flat, and to bring it in by rail would be very expensive. There were, however, a number of very large sawmills in New Bern close to the places mentioned, and thousands of cubic yards of mill waste and sawdust were burned to get rid of it each year, enough, I think, in one year, to fill both places. Several other towns and villages could also be named where mill waste can be thus used to good advantage.

Independently of its convenience, the writer counts it, except clean sand and gravel, cinders, etc., the best of all fillings for this purpose. It should, of course, be heaped up a little above the level—the depression overfilled—to allow for settling.

II. INDUSTRIAL COMMUNITIES.

The writer has had much better success in getting anti-malarial work done in industrial communities in which the bulk of the population is engaged in a few large industries than in the ordinary commercial town with diversified occupations and interests. One reason for this is that the managers of large interests, who must finance such work, are business men who have sufficient prevision to see the ultimate economic advantage of sanitation and are accustomed to spend money for a sufficient return in the future; while the ordinary town-council of small towns is not accustomed to spending money which does not give an immediate materially tangible return—and for that grudgingly. The one is willing to spend a dollar to secure more than a dollar's worth, the other hates to spend a dollar independently of what the return is. I must say, however, that many of the managers of industrial plants, and especially those I am purposing to instance, have been actuated by a sincere desire to benefit the community. With some the comfort, health and good appearance of the "mill village" was a matter of much pride. Still, they themselves lay stress on the *economic* advantage of anti-malarial work.

This, indeed, was the factor which dominated the sanitation of the Canal. The motive of the Sanitary Department was not primarily humanitarianism. *It was to prevent loss of efficiency from sickness of the force working to build the Canal.* The Canal Zone was a typical industrial community with only one manager—the United States Government.

Electric Mills is a village of about nine hundred or a thousand people, most of whom are connected directly or indirectly with a large lumber plant. The natural obstacles to sanitation, I speak only of malaria, are very great. The land is flat; it is low lying and it is im-

pervious to water; so that water will neither run off nor soak in, and in May, 1914, it stood in many pools, big and little, breeding anopheles. The malarial index of practically the whole population taken last spring, before the flight of anopheles had begun, was approximately 12 per cent. This represents the proportion of carriers *who came through the winter* as such, and was indeed rather less than that proportion, as some people had recently taken full doses of quinine—30 grains per day—and naturally gave negative blood smears. It was unquestionably malarious.

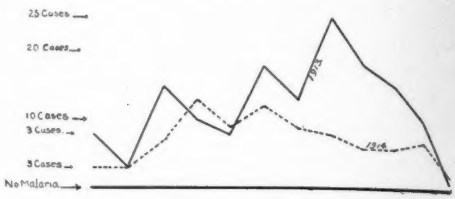
The work to be done was planned, mainly by LePrince, Sanitary Engineer, United States Public Health Service, put in writing and explained to the manager of the plant and to Dr. Champenois, who had direct charge of the sanitation. It was gone into in much detail, and to carry it out involved much careful work and considerable expense. The manager undertook to do it, saying: "If it will do what you say, it will pay me in increased efficiency of my hands, and if it don't I'll do it anyway."

LePrince visited the place in September and found the work well carried out. Champenois sends a chart showing a greatly improved condition. The number of cases of malarial fever fell steadily from June, when the work was begun, reaching its lowest in September, instead of rising as in previous years. This, in spite of a higher rainfall this year than normal in every month after June and nearly as much in May and June. The number of cases per unit for August and September, 1913, were 25 and 18; as compared with *8* and *6* for 1914. It was 68 in September, 1912. The highest number for 1914 was 14 in *April*, due to the relapses from last season, so common on the advent of the first warm weather.

Prior to this a great improvement had been produced over previous conditions by the work of Dr. Champenois—an enthusiastic and efficient sanitarian—begun in September, 1912, and it is the more creditable to the work of

RESULT OF ANTI-MALARIA CAMPAIGN AT ELECTRIC MILLS, MISS.

September, 1912 to December, 1914.



RAINFALL			
	1912	1913	1914
January	3.90	2 88	0 87
February	0.59	2 29	3.25
March	6.98	4.31	6.85
April	4.56	0.49	1.45
May	1.61	3.40	2.42
June	4.27	2.98	1.91
July	1.20	0.84	2.95
August	3.98	T.	5.65
September	0.98	4.43	5.95
October	2.00	1.20	2.00
November	0.02	1.29	3.20
December	4 07	2.49	Incomplete

Total Rainfall April 1st, 1912 to Nov. 1st, 1912—18.6"
Total Rainfall April 1st, 1913 to Nov. 1st, 1913—13.78"
Total Rainfall April 1st, 1914 to Nov. 1st, 1914—22.33"

1914—also carried on under his direction—that it made so great a reduction from the already reduced morbidity of 1913.

The results for 1915, with the elimination of a number of relapsing cases, should be still better. The blood index has been taken for April, 1915—before the flight of anopheles—but not yet reported.

At Roanoke Rapids the result is even better. In the fall of 1913 the writer and Dr. von Ezdorf visited this place, in September and October respectively, and found it breeding anopheles in great numbers. The reports of

the physicians, the appearance of the people and finally an index taken by von Ezdorf, showed much malaria. The condition to be remedied was nothing like as difficult as at Electric Mills, as there was plenty of slope. Here, too, the managers of the industrial plants took up the work. The mayor of the town was fortunately both a business man and an engineer, and the mill physician and health officer, Dr. Long, was enthusiastic and energetic. All these men here, however, seemed to be actuated rather by altruistic than by economical motives. The work was planned last fall (1913), $3,500 was raised by the three mills, and the Power Company and the work was started. This was increased later from other sources to $3,804. LePrince inspected and advised about it in June and again in September. He states that the place was practically free from anopheles and anopheles larvae. A blood-index taken in October by von Ezdorf and Derivaux gives 4.48 per cent only, as against 14 per cent in 1913.

The health officer, Dr. Long, who in no small degree is responsible for this work, writes: "As compared with last year, the diminution of the number of people who had malarial attacks was only 16 2-3 per cent," but of these he judged 95 per cent to be recurrences of old infections. There was a great diminution in the severity and in the number of attacks, so that the inefficiency ratio in September, when it is highest, was judged to be from 4 to 5 per cent, as compared with 40 to 50 per cent last year. The improvement in general health and well-being is very great. As an investment, even, the money expended has paid. Next year, as much of the work done is permanent, the expenditure will be for maintenance only, and much less, and the diminution in the number of people having malaria will continue and increase in ratio. The health officer thinks that this place is practically free from malaria from this time on, and I judge this is true. Some excellent work was done here, especially in the utilization of industrial waste as a larvacide.

These two instances are given simply to illustrate the advantage of working in an industrial community. At Electric Mills the work was difficult and expensive, and I would not have advised it being attempted had the village been the ordinary one of various interests and avocations. I would have advised the people to move away. At Roanoke Rapids the work was plain enough, but very extensive, *i.e.*, covered much ground in proportion to the population, and, I am sure, would never have been carried to success had it not been an industrial town. A residential town in South Carolina was surveyed last summer, and the work needed for its malarial sanitation carefully planned and explained. The problem was on the same lines as that at Roanoke Rapids, but a far easier one. Yet the state health officer tells me that nothing has been done there, or will be done, except by one institution in it.

This note is given so that sanitarians may know what communities are most apt to avail themselves of their help—to profit by their advisory work.

THE ADMINISTRATION OF QUININE IN MALARIA.

By Hugh Boyd, M.D.,
Scottsboro, Ala.

The strength, solubility and absorbability of the salts of quinine in common use are as follows:

	Contains of the alkaloid	Is soluble in parts of water	Is detected in the urine in	Reaches its heighth of elimination in
Quin. Sulp.	74%	720	45 min.	6 hrs.
Quin. Bisulph.	59%	8½	30 min.	6 hrs.
Quin. Hydrobrom.	76%	40	35 min.	6 hrs.
Quin. Muriate	81¾	18	15 min.	3–6 hrs.
Quin. Bimuriate	71¾	Less than its wt.	15 min.	3–5 hrs.
Quin. Tannate	30–35%	800	3 hrs.	24 hrs.
Quin. Ethyl Carbonate	81%	12,000		8–10 hrs.

The bimuriate of quinine, on account of its solubility and the rapidity of its absorption, is the best preparation to use. It is to be pre-

ferred when a quick effect is desired, and is to be used intramuscularly and intravenously to the exclusion of all other salts. It can oftentimes be given to patients with impunity in whom sulphate causes urticaria. The hydrobromide and ethyl carbonate will often act well on patients in whom the sulphate produces gastro-intestinal and nervous disturbances.

The methods of giving quinine are: Orally, intramuscularly, intravenously, by rectum and by inunction.

Quinine, given by the mouth, may be given in capsules, syrups, pills, tablets or in the dry powder with water or in other liquids. This is the easiest and quickest method of administration, is painless and usually devoid of after effects. The drug is more rapidly absorbed and the dose can be regulated better than when given by other methods. It is a great mistake to think that quinine is absorbed quicker or in greater quantity when given subcutaneously than orally. Experiments and practice show the reverse to be true. When given in concentrated solution subcutaneously it may not and often is not absorbed at all.

Quinine is readily absorbed when given in capsules, syrups or as the dry powder with water or other solutions except in a few exceptional cases of chronic malaria in which the whole portal circulation is greatly engorged. Quinine pills and tablets are not readily absorbed because their coating is so hard the juices do not always dissolve it, and of course their effects are uncertain.

Quinine should always be given to children in solution. The best preparation probably is the ethyl carbonate in simple syrup; and can be given in doses from 1-2 to 3 grains. As it is almost tasteless, do not incorporate with it an alcoholic or acid solution, thereby making it very bitter. The tannate is also quite tasteless and can be given in chocolate confections or syrup. It is somewhat more bitter than the ethyl carbonate, weaker and much slower of absorption; sometimes quite a serious objection. For adults the fresh gelatin capsules will serve our purpose; and the cases are rare in which the stomach will not retain and absorb it, when given in small doses. It has been my experience that when the capsules are not absorbed it is best not to trust quinine in the stomach at all, but give it intramuscularly.

It has been shown repeatedly that when given subcutaneously or intramuscularly quinine does not appear in the urine as quickly as when given by the mouth, and reaches its height of elimination later; and also that when given subcutaneously in concentrated solution it reaches its heighth of elimination later than when given in dilute solution. There are conditions, however, that necessitate the intramuscular method, as acute gastritis, irritability of stomach in which the quinine is rejected, excessive passive congestion in which quinine is not absorbed, comatose, convulsive and algid malaria. The solutions usually recommended for intramuscular use, 3 to 5 grains dissolved in 6 to 10 c.c. water, are altogether too concentrated. Quinine is an irritant to the tissues, and when given in these concentrated solutions irritates the tissues to such an extent as to bring about a coagulation necrosis and sometimes a chemic slough. The system throws a protecting wall around this irritating, painful, indurated mass, and as a result very little or none of the quinine is absorbed, thereby defeating the very object for which the intramuscular injection is given. Then in order to get results from the intramuscular injections, we must give the quinine in dilute solutions, not over 1-3 gram to 10 c.c. of sterile water. The salt to use is the bimuriate; the bisulphate and hydrobromide may be given if the bimuriate is not readily obtainable.

It can be given with the Luer syringe, or the ordinary antitoxin syringe in one injection, or in the ordinary glass hypo syringe or an S. & D. syringe in several injections. Do not try to give in a metal syringe. Everything should be made aseptic as possible—the buttocks, the solution, the syringe and needle.

Boil 3 drams of filtered water; to this add 5 grains of bimuriate quinine and bring to a boil again. Inject this deep into the gluteal muscles. If necessary to give 10 or 15 grains, this can be repeated. Quinine given in this way in these dilutions will not give rise to anything more than slight indurations and is quite readily absorbed.

The solution usually recommended for intravenous injection is 1 gram to 10 c.c. of sterile water. To me this seems too strong and I would advise it given more diluted. On this point, however, I'm not competent to speak. For in an experience of sixteen years in a highly malarial section and having seen and treated malarial infections of all kinds and severity, I have never seen a case in which I thought it best to give the quinine intravenously. Reports on it, however, show that it is most excellent in pernicious malaria, the mortality being cut down almost one-half by this method of administration.

Quinine may be given by the rectum, in solution or suppository. The bimuriate is found in the urine in 30 to 35 minutes after being given by rectum in dilute solution. I do not think we are ever justified in giving it by suppository as the absorption is too slow and too uncertain and it too often causes irritation and tenesmus.

The muriate of quinine is very soluble in glycerine, and some claim it can be rubbed into the skin in this way. After thoroughly rubbing the glycerine-quinine solution it disappears. Whether the quinine goes in with the glycerine I do not know.

There was and is quite a good deal of discussion as to the proper time to give quinine and the dosage. Three methods are in use.

1. That of Torti—or a single large dose before the paroxysm.

2. That of Sydmham, or a single large dose in the decline.

3. That of fractional doses.

A modification of all these is to be preferred, suiting the modification to the demands of the individual case.

The adherents of Torti base their claims on "the fact that the parasites are more susceptible to the action of the quinine after sporulation," and when one large dose of quinine, say 15 grains, is given 4 to 6 hours before the expected paroxysm the parasites will be killed after they have sporulated in the merozoite stage.

Sydmhom's method consists in giving about 15 grains of quinine in the sweating stage, and usually prevents succeeding paroxysms. Both these methods call for the administration of a single large dose of quinine, which according to my experience is quite objectionable, because:

1st. The stomach may reject this large dose. I have seen large doses rejected and severe and prolonged vomiting follow their administration.

2nd. It may produce quite an irritation and even inflammation of the gastric mucosa. I have in mind now two cases of acute gastritis which I thought due to 30 grain doses of quinine sulphate.

3d. Large doses are quite depressing to the heart.

4th. Fifteen to twenty per cent less quinine is eliminated, and of course that much less is absorbed when given in one large dose than when given in 4 to 6 broken doses.

5th. It may happen that there is a double infection of the tertian or quartan, even when the peripheral blood shows only one group.

6th. The single large dose is not adapted to treatment of estivo-autumnal infection, for these parasites sporulate irregularly.

7th. It has been shown by repeated examinations "that when quinine is given in one large dose a large number of parasites escape entirely or are little affected, but when given in divided doses it exercises a very injurious effect on every stage of the human life cycle of the tertian parasite." Deadrick.

8th. An experience of many thousand cases proves to me beyond all question that the method of giving quinine in small doses at frequent intervals is by far the best. The

usual method of giving one grain an hour to the adult is the one I pursue, giving two grains every two hours, three grains every three hours, or four grains every four hours. We endeavor to get the quinine in the patient as soon as possible, without discomfort or injury to his stomach, heart or nervous system, modifying the dose to suit the demands of the disease and the tolerance of the patient. For instance, if we are called to see an adult a few hours before the paroxysm, we give him 6 to 8 grains at once and one-half to three-fourths this dose in two hours, then continue with 3 grains every three hours or 4 grains every four hours; for it has been clearly proved that when quinine is given before segmentation, and repeated at 3-hour intervals, it acts on the plasmodia not only while free in the blood, but on every stage of its human life cycle.

If, however, we think necessity demands it and the stomach will retain and absorb it, 10 or 12 grains can be given at once and 5 grains in two hours; and then continue with smaller doses at intervals of three hours. Our object is to get the quinine in the system as soon as possible without injury or serious discomfort. Some patients can and do take as much as 15 grains for an initial dose, and when demanded it may be given once, but a long experience with malaria of all kinds and severity has taught me that it is rarely necessary to exceed the doses named.

If we see the patient during the fever or later begin to give quinine at once. Do not wait for the action of a purgative. It is the malarial parasite we are after and not bile.

The quinine should be kept up in this manner for forty to seventy hours after the fever has subsided, because the system can accommodate several billions of parasites without much reaction, and if we would prevent chronic malaria we must destroy the gametes, which are very resistant to the action of quinine.

After forty to seventy hours after the fever has subsided the dose can be cut in half for several days, then 10 grains of quinine every other day for two or three months will usually rid the patient of the parasites. It is better to give at least on one day out of the week 15 grains; for the resisting strain of the parasites will succumb to 15 grains given on every third day better than to 5 grains given every day.

The young and half grown tertian and quartan gametes are sometimes killed by quinine, but the estivo-autumnal are very hard indeed to kill, and quinine given for long periods will sometimes not affect them. They are lodged in the bone-marrow and spleen. In cases of this kind the patient may eventually cure himself; quinine will not. It has been shown repeatedly that these sexual forms, the mosquito plasmodia, do not develop for 8 to 14 days after infection; then if we would cure our patients of malaria the time to do so is in the very beginning within the first few days. Active and vigorous treatment will do it.

Formerly and even now by some physicians quinine is given in enormous doses—60 to 150 grains in 24 hours. So careful an observer as Dr. Craig claims that the system will not take up these doses; that 40 to 60 grains will saturate the system and it cannot take up more. I'm not prepared to accept these assertions; for why should we have symptoms of poisoning and even death following them, when smaller doses often repeated do not produce these symptoms. I have found, however, that the cases of malaria that will demand more than 30 grains of quinine in 24 hours, and a larger initial dose than 10 grains are very rare.

In the treatment of chronic malaria we have to deal with the schizogonic and parthenogenetic cycles. The treatment of the first is that of acute malaria. We know that the relapses in chronic malaria are due to the sporulation of the parthenogametes, which occurs more or less regularly at intervals of a week or multiples thereof. The acute symptoms are treated with quinine given as in the acute stage. Then 16 to 24 grains of quinine are

given every sixth and seventh days for two and a half to four months, always giving 3 to 5 grain doses every 3 to 4 hours. I give more quinine on the sixth than on the seventh day because of the accumulative action of the drug.

In those patients who show plasmodia in the blood and have no symptoms quinine should be given just as in acute malaria until the plasmodia disappear, and then as directed in chronic malaria. In these cases I have rather infrequently seen the quinine arouse the latent malaria and bring about fever and other symptoms of the disease. These subside, however, in a few days, if the quinine is persisted in or other malarial remedies given. Just how to account for this I do not know—unless the quinine stimulates the parthenogametes to reproduction.

In pernicious malaria we resort to the oral administration if we can, to the intramuscular injections if we must, and oftentimes to both. There are many cases, especially in children, on the border line between benign and malignant malaria of the cerebral type, in which we may be in doubt as to the best method to pursue. These patients can often be aroused and made to swallow and will keep the dose. When such is the case, give quinine orally. If, however, they can't be aroused, or when aroused reject the medicine, do not hesitate to give it intramuscularly, deep into the gluteal muscles. There are some cases of algid and gastrointestinal malaria in which it is imperative to give the quinine intramuscularly. In these malignant cases give quite a large initial dose, 10 to 15 grains intramuscularly, and repeat by half every 6 to 10 hours as required thereafter.

Let me insist again that the solutions be well diluted, thoroughly aseptic and injected deep into the muscles. Never give quinine subcutaneously. If we are not able to see our patient every 6 to 8 hours and the drug cannot be given by mouth, we can have the attendants give 25 to 35 grains of the bimuriate with 10 to 20 drops of tincture opium in 3 to 5 ounces of warm water in the rectum.

I have seen a number of cases of grave malaria which were able to take and retain quinine by the mouth, but in whom there was no evidence of absorption, either in a cinchonism or on the parasite. In cases of this kind give quinine intramuscularly.

There has been a great deal of controversy in the last fifteen or twenty years about a so-called continued malarial fever. Without going into a discussion of this matter, I will say that in cases whose blood shows the parasite, give quinine as in acute malaria. If the case is one of uncomplicated malaria and the drug is judiciously administered and absorbed, the febrile symptoms will subside in three to five days. If the blood shows very few or no parasites we are justified, in the great majority of cases in malarial regions, in giving quinine as in acute malaria. If the febrile symptoms do not subside in five days after the judicious administration of the drug, and in the absence of complications, then we will find our disease not malaria, but a typhoid or a kindred or septic infection. In such a case the further administration of the drug will probably be harmful.

Without going into a discussion of the causes and pathology of hemoglobinuric fever, I will say quite positively that quinine has no place in its treatment except in prophylaxis. A few cases occur without the previous administration of quinine; most of them follow the administration of quinine. Most all cases are chronic malarial subjects, and almost all of them (95 per cent show the malarial parasite just before the attack, about 65 per cent of them show the parasite on the first day of the attack, 15 to 18 per cent show them on the second day and practically none of them give the parasite on the third day. This is what quinine does. Then why give quinine when the system is doing something or generating a something that is doing the work so beautifully? It seems to me that there is no other disease or condition in which nature has

spoken to us in such strong language as she has in hemoglobinuric fever. She tells us by the only means possible—the blood—that she is destroying the parasites and calls out to us by the vomiting, the circulation and the urine for help. Quinine will disturb the stomach and increase the vomiting. It will depress the circulation and aid in a suppression, without doing a particle of good in destroying the parasite. It will increase the hemolysis and bring about or continue the condition. The proper treatment of this condition then is not quinine at all, but elimination and support.

Speaking of the prophylaxis of malaria, Craig says: Two and a half grains given every evening will be sufficient for most instances, but where the estivo-autumnal parasite is prevalent larger doses will be required; and that 15 grains given every seventh day will prevent, but advises 10 grains every third night for two or three weeks after reaching the infected section, and every fifth night thereafter. Quinine in these doses will be effective, but unfortunately we cannot give them in private practice, and besides I think it best to give smaller doses and oftener. Five grains every night for the first week, four grains for the next two weeks, and three grains each night thereafter will prevent and is much easier to be given in private practice than the larger doses.

If the section is highly malarial and the population infected, the best prophylaxis for pernicious malaria and blackwater fever is to give 15 to 20 grains on two successive days and repeat this every five days.

MALARIAL ANAEMIA.

By S. Chaille Jamison, M.D.
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Malarial infections cause their ill effects in two ways, first by the liberation of toxines and second by the production of anaemia. The toxines give rise to the well-known phenomena of the malarial paroxysm. In the course of time these toxines have a marked deleterious effect on the blood-forming tissues. The production of anaemia is due to two factors, primarily the destruction of red blood corpuscles at each sporulation of the parasites, secondarily to the gradual loss of productive power in the bone marrow. At each sporulation, in an ordinary infection, about seven drachms of red blood corpuscles are destroyed; the blood-forming tissues while yet uninjured, make up this destruction of cells while the parasite is in the intracellular stage. A certain number of merozoites are destroyed by the serum at each sporulation—sometimes few, sometimes many, rarely all. In the last event there is spontaneous recovery with no anaemia, because the blood-forming organs are as yet uninjured and able to replace the destroyed red cells promptly. In the second case, where many parasites are destroyed, the next paroxysm is no more severe, or is less severe, than the first; there has not been enough liberation of toxines to materially affect the bone marrow, and the restitution of corpuscles is again complete, and no anaemia follows. But this balance cannot be kept up for long, as at each sporulation there is a certain amount of injury to the blood-forming tissues, and finally there comes a time when the injury to these tissues has become so great that they are no longer able to meet the demand for new corpuscles, and anaemia supervenes.

The greater the number of infecting plasmodia and the fewer destroyed merozoites at each sporulation, the greater the amount of toxine liberated at each sporulation and, therefore, the greater the damage to the bone mar-

row; also, more corpuscles are destroyed and the power of replacing them is diminished; consequently the more rapid and greater is the production of anaemia. It must also be borne in mind that under normal conditions a certain number of red blood corpuscles are constantly being destroyed. If, then, there is a massive infection by malarial plasmodia, a great number of red blood corpuscles are destroyed and occasionally the vast amount of toxine liberated is so highly toxic to the hematopoietic organs that they are permanently injured and the production of red blood corpuscles ceases; when this happens, even if the infection is promptly cured, there is the supervention of an acute, aplastic anaemia; because the corpuscles normally destroyed can never be replaced. That this is true is borne out by the fact that, though the anaemia is most profound, nucleated red blood corpuscles are never present.

Classification:

Anaemia of the secondary type.
Anaemia of the pernicious type.
Acute aplastic anaemia.

Anaemia of the secondary type: Following an ordinary attack of malaria, whether recovery comes about spontaneously or by treatment, examination of the blood will show that the number of red blood corpuscles is reduced, rarely to less than 2,000,000 per cubic mm., and that the haemoglobin is reduced to a corresponding degree; the color index remains at one, or a little below. The stained specimen shows a slight anisocytosis, very rarely polychromatophilia or poikilocytosis, and no nucleated red blood corpuscles (as a rule). The differential count is about as follows: Poly-morpho-nuclear neutrophils, 55 per cent; lymphocytes, 30 per cent; endothelial leukocytes, 12 per cent; eosinophiles, 2 per cent; basophiles, 1 per cent. The total number of white blood corpuscles is slightly reduced, usually to about 5,000; there are no abnormal white cells. Clinically, patients suffering from this type of disease condition display the well-known symptoms of an ordinary secondary anaemia. If the parasites are destroyed, this type of anaemia rapidly disappears, and requires no special treatment, though a course of arsenic and iron will hasten cure. In this type the hematopoietic organs are only slightly injured, and their functioning power only inhibited, never abated; so that although the malarial infection be severe and prolonged, the anaemia, though severe, perhaps, is always of the secondary type and never fatal, per se. These cases are common in any malarial district.

ANAEMIA OF THE PERNICIOUS TYPE.

This type can only follow when malaria has existed for a long period. In the cases that I have seen it has not occurred before the infection had lasted for five years. The examination of the blood shows a typical picture of pernicious anaemia, i. e., the color index is generally high (1.3 to 2), the haemoglobin varying from 30 per cent to 50 per cent, and the total red blood cells from about 1,000,000 to 3,000,000; the differential count usually shows a basophelia and increase in the lymphocytes and endothelial leukocytes, with a diminution in the number of neutrophiles. Megalocytes are present in abundance, nucleated red blood corpuscles of all varieties are present and occur in typical "showers;" there are usually a few abnormal white cells; poikilocytosis, anisocytosis, polychromatophlia are marked; the "white" count shows a leukopenia.

It is very rare to find plasmodia in these cases at the first few examinations, because quinine has usually been taken, and this is especially true of white patients, because they are in the habit of taking quinine regularly when in malarial regions; but with the negroes or ignorant natives, who do not take quinine, it is not uncommon to find many plasmodia in the blood. In one of my cases there were many normoblasts and almost as many red blood corpuscles containing tertian plasmodia; it was difficult to find a field containing a plasmodium, in which a nucleated red blood cor-

puscle was not also present. If quinine is avoided for three weeks it has been my experience that plasmodia can always be demonstrated at the end of that time. I am fully aware that most authorities hold that the aestivo-autumnal parasite is more prone to give rise to the severe forms of anaemia, but, in my experience, the tertian parasite is the cause fully as often. The recognition of such cases is of great importance for two reasons; first, because if a case has been diagnosed pernicious anaemia from the blood picture, but malaria is proved to be the etiological factor, the prognosis, from being of the worst, immediately becomes most favorable; second, these cases are of great importance from the standpoint of treatment, for it has been my experience that these cases are refractory to quinine treatment alone, and do not improve to any appreciable extent until a vigorous treatment has been instituted for the anaemia. I have found hypodermic injections of cacodylate of soda to be far more efficacious than the administration of arsenic by mouth. Unfortunately I have found that the hypodermic injections of iron are so painful that a patient only stands them with extreme discomfort, and therefore recommend its administration by mouth. It seems to me that it is not justifiable to make a diagnosis of *idiopathic* pernicious anaemia in this climate until it has been ascertained that no quinine has been taken for at least three weeks prior to blood examination. The time of the appearance of plasmodia after the administration of quinine would largely depend, of course, on the amount of quinine given and the manner of its administration, but I have set the time at three weeks because of the following experience: A patient from Hondurus applied to me for treatment and said that she was in the habit of taking ninety grains of quinine daily and had done so for years. A thorough examination of the blood showed a typical picture of pernicious anaemia but no plasmodia. The quinine was stopped and blood examination made every other day for three weeks. At the end of this time tertian gametes and schizonts appeared in the blood. I consider this of importance because there will be found few patients who take ninety grains of quinine a day (the probabilities are, of course, that she actually absorbed only a small part of this), and because careful examinations were made at short intervals. It appears safe to say if no plasmodia are found after the patient has been three weeks without quinine that malaria is not the cause of the anaemia.

ACUTE APLASTIC ANAEMIA.

In regard to acute aplastic anaemia, I must admit that I have never seen a case of malaria accompanied or followed by an anaemia which I could definitely place in this class. I have, however, frequently noted, in cases of fatal comatose malaria, extreme anaemia of both the red cells and the haemoglobin, with the absence of poikilocytosis, anisocytosis, polychromatophilia, and erythroblasts.

The few cases that have survived have made a prompt recovery from the anaemia, with all of the blood findings associated with regeneration of the bone-marrow. I have no doubt that this type of anaemia occurs in certain of the severe comatose malarias and materially aids in the causation of death.

AUTHORS' ABSTRACTS.

Tropical Diseases and Public Health.

Sewage Disinfection for Vessels and Railway Coaches. By Leslie C. Frank, U. S. Public Health Service, Washington, D. C., April 8, 1915. Public Health Reports, Jan. 1, 1915.

An apparatus has been devised to automatically disinfect sewage from vessels and railway coaches. The sewage is allowed to accumulate until a predetermined height is reached. At this point a float opens a steam valve and steam is introduced until the liquid comes to boiling. At this point enough pressure is developed in the apparatus to force the sewage out. As soon as the sewage has been forced out the descending float turns off the steam and the apparatus is ready for the next dose. Experiments on the effluent show a total absence of b. coli and a total count of 11 bacteria per c.c., which were probably spore formers and therefore not pathogenic.

For trains this device need not be over 12 to 15 inches high, 12 to 15 inches wide and four feet long, and may therefore be suspended under the

end platforms of the coaches laterally across the coach. The equipment of railway coaches with this device would make it possible to keep the toilet doors unlocked at all times instead of being locked at railway stations and while passing over watersheds for drinking water. Discharge from the device will cease immediately if the toilet be flushed and not begin again until the added material has been brought to the boiling point. At railway stations the steam may be turned off so as to prevent discharge on the station platform. It should be turned on immediately when leaving the station, just as now the toilet doors are unlocked at this time.

Influence of Immigration on Dissemination of Tuberculosis, and Importance of Detecting This Disease. By F. A. Ashford, U. S. Public Health Service. Military Surgeon, February, 1915.

This paper comprises but one phase of the prophylaxis of tuberculosis, and only certain well defined points, which deserve our attention, will be outlined.

First—By what authority are aliens afflicted with tuberculosis refused admission into the United States? The law reads: "The following classes of aliens shall be excluded: . . . Persons afflicted with tuberculosis," etc. Within the meaning of the law, tuberculosis is held to include only: Tuberculosis of the respiratory, intestinal and genito-urinary tracts. Before a certificate of tuberculosis of any of these tracts can be issued, the presence of the tubercle bacillus must be demonstrated microscopically.

Second—The responsibility of the medical officer does not end in detecting such cases, whose contagious nature is proven, but it is his duty to certify all aliens whose physical condition would furnish a suitable soil for the growth of the tubercle germ.

Third—A study of the environment of the aliens coming to our shores reveals conditions favorable to the propagation of tuberculosis. Overcrowding, lack of adequate air space and light, poor ventilation with dampness, are some of the deplorable conditions existing in the foreign quarters of our population.

For these and many other reasons, it is necessary to plant a healthy stock, at the same time that we strive for reforms looking to the amelioration of living conditions among our foreigners. One active case of tuberculosis allowed to pass this primary inspection may be the means of causing the rapid spread of this disease in the soil already prepared by our short-sighted indifference.

Observations in Tropical Pathology. II. Three Frequently Silent Lesions: Gastroduodenal Ulcers, Gall-Stones and Pancreatitis. Their Relative Incidence in Panama Canal Laborers as Disclosed by Autopsy. By H. C. Clark, Ancon, Canal Zone. American Journal of Tropical Diseases and Preventive Medicine, March, 1915, pp. 556-571.

The old idea of preponderance of the gastric ulcer over the duodenal ulcer was not borne out. The chronic peptic ulcer occurred with the same frequency as gall-stones. Pancreatic disease, either focal or general, was rarely encountered and in those instances was usually associated with some sequel or accident to a gall-stone or a duodenal ulcer.

There was a coincident occurrence of two or more members of the trio in twenty-one of the individuals; gall-stones and ulcers of the duodenum and stomach occurring together in 14 cases; gall-stones and pancreatitis in two cases; gall-stones, ulcers and pancreatitis in 4 cases.

Clinical evidence had been offered in 19 of the cases of gastro-duodenal lesions; in 12 of the gall-stone cases, and in only one of the cases showing pancreatic disturbance.

The commonest accident noted in relation to the ulcer cases was perforation, and this usually occurred in the duodenum. Malignancy was occasionally encountered in both the gastric and duodenal ulcers.

Gall-stone accidents were principally those of lodgment in the ducts. There were two cases associated with carcinomatous developments in gall bladder and ducts.

Spontaneous cures of gastro-duodenal ulcers were apparent in several cases. Similar cures were also noted in gall-stone cases where ulceration into the duodenum had occurred.

It appears that a large number of cases of gall-stones and gastro-duodenal ulcers lead a latent life and also that the pancreas may lose a considerable portion of its tissue without disclosing its lesion.

Venereal Disease. Its Probable Prevalence—An Attempt to Reach a Definite Basis of Statistical Value. By Charles E. Banks, U. S. Public Health Service, Washington, D. C. Public Health Reports, February 26, 1915, pp. 618-622.

Given, a certain well-defined group of persons of whom a record of ailments has been kept under official supervision, and reduce it to an equation, using the whole population as the other factor, is the basis of Dr. Banks' thesis. For over a century merchant seamen of this country have been treated in the marine hospitals, which are under the jurisdiction of the Public Health Service, and accurate records have been kept of their injuries and diseases. The whole number of merchant sailors in the country being known through the census returns, numbering now about 140,000 males of fifteen years and over, the records of the service show how many of them were sick and for what they were treated. Among their diseases it has been found that a little over eight per cent were afflicted annually with venereal diseases. This covers a record of a million and a half cases of sick and disabled seamen, treated in the last thirty years ,a number sufficiently large to eliminate all semblance of accidental conditions. There are about 28,780,929 males in the United States of the age of fifteen and over, and the same per cent should show infection. Therefore, the proposition in ratios gives the following result—making due allowance for the mode of life and social surroundings of the sailor: A probable total of over two and a half million cases of venereal diseases requiring treatment annually among males throughout the United States. This is equal to about one person in every forty of entire population.

MEDICINE

(INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.)

CLINICAL NOTES ON TUBERCULOUS IMMUNITY.

By B. M. Randolph, M.D.,
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Investigations of the past few years have altered very materially the views previously accepted upon tuberculous infection and immunity. The result of these investigations seems to be the determination of two points:

1. That infection occurs chiefly in childhood, and that the development of tuberculosis in later life is not the result of adult exposure, but an auto-infection, i. e., the extension of a latent focus implanted in childhood.

2. That infection by the tubercle bacillus, when not fatal, confers a relative immunity against subsequent infection both from within and without, and that such immunity is not acquired in any way save by infection.

The modern views on this subject are summarized in two papers, one by G. F. Bushnell, in the *Military Surgeon* of January, 1913, and the other by F. R. Baldwin, in the *Johns Hopkins Medical Bulletin* of July, 1913. While the clinical material reported in this paper bears only on the second of the two points above mentioned, the conclusions reached by these authors seem to require more general comment. In summarizing his paper Baldwin states that:

"(a) Most adults have received some tuberculous infection.

"(b A variable degree of specific allergy is thus acquired.

"(c) During ordinary health the tissues repel tubercle bacilli, partly with the aid of specific allergy.

"(d) Reinfection is mostly autogenous superinfection, and due to disease, overstrain, trauma, or any cause of lowered vitality, whatever that may mean.

"(e) As a corollary, adults are very little endangered by close contact with open tuberculosis, and not at all in ordinary association. Childhood is the time of infection, youth the time of superinfection, and that from an extension of the primary disease."

And he further concludes:

"There has been too much read into the popular literature by health boards and lecturers that has no sound basis in facts, and it needs to be dropped out or revised. More protection for children and better hygiene for adults are logically demanded, but beyond this the preachments about the danger of infection to adults in the present state of society are without justification from an experimental standpoint. Deductions from case histories must be accepted with much doubt, when circumstantial evidence is presented showing the source of infection to be recent exposure in adult life. This is particularly applicable to the question of hospital and dispensary contact for nurses and resident staffs. It also applies to alleged infection of married partners, already the subject of careful investigation, without producing satisfactory proof of infection."

Those of us who are engaged with the clinical side of the issue will receive with gratitude the experimental evidence of what many of us have long believed, i. e., that the danger of infection of adults through ordinary contact with open cases has been exaggerated. Lest, however, we proceed too hastily to the opposite and possibly dangerous extreme of ignoring altogether exposure to open cases, it is appropriate that we should receive the above conclusions with a proper realization of the limitations of experiment; that we should

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***Read before the Clinico-Pathological Society of Washington, D. C., January 19, 1915.**

reflect that future experiment may still add something further to our knowledge of the matter; and that the very bacillus dodging propaganda, which are now decried, were based on data furnished by what we were told was experimental evidence. Experiment justifies the acceptance of positive facts, *but not of negative inferences.* While it is very probable that the majority of adults are immune to the ordinary sources of infection from without, it is not yet proved that this immunity may not undergo such a diminution as to fail to protect against prolonged and repeated exposure. The number of instances where a group or series of adult cases have developed following the occupation of infected rooms or houses, instances in which we should have had no reason to expect the development of tuberculosis under other conditions, is sufficient reason against the too literal acceptance of the conclusions which would naturally be drawn from the statement that "preachments about the danger of infection to adults in the present state of society are without justification from an experimental standpoint." The practical conclusion that I should draw from the immensely valuable investigations on the subject are that we should discourage phthisiophobia, but disinfect quarters that have been occupied as dwellings by cases of open tuberculosis.

In reference to the question of how immunity toward the effects of the tubercle bacillus is acquired and maintained, I shall quote from the extensive literature only a few extracts, which illustrate the important work that has been done. Following the observation of Webb and Williams in 1910 that animals could be immunized against the effects of fatal doses of virulent tubercle bacilli by the injection of small doses of living bacilli, the subject of tuberculous immunity was further developed in Germany, chiefly by Römer. The observations of Römer have been repeated by numerous other observers, and his conclusions have been confirmed, and are now generally accepted.

Webb and Williams injected a guinea pig with gradually increasing doses of living tubercle bacilli, up to 300 times the fatal dose. The animal was killed after 21 weeks, and was found free from tuberculosis. A second guinea pig injected with gland emulsion from the first developed no tuberculosis.

P. H. Römer, Beitrag zu Klinik der Tuberculose, 1912, xxii, p. 301, Tuberculous:

"Infections occurring in childhood, when not acutely fatal, produce an increased resistance, as compared with the normal organism, to tuberculous infection. The immunity thus begotten is effective, as a rule, against infection from without in later years. Special conditions of a physiologic or pathologic nature enable the tubercle bacilli domesticated in the body to multiply in such a way that the grade of immunity present is no longer sufficient to protect against the disease producing consequences of a metastatic reinfection, and thus occurs the development of new tuberculous foci, and of renewed symptoms of tuberculous disease."—(Trans.)

C. Siebert conducted experiments to test Römer's claims, and found them sustained, as follows:

An animal given a protective dose of living tubercle bacilli was later given 10 mg. of virulent tubercle bacilli. It lived 74 days, while the control died in 30 days.

A protected animal given 1 mg. of virulent bacilli died at the end of 123 days of cavernous lung tuberculosis, while the control died in 38 days.

A protected animal given .001 mg. of virulent tubercle bacilli remained unaffected, while the control died in 52 days.

He concludes that:

1. Mild tuberculous infection confers a more or less strong protection against later severe infections.

2. The grade of the conferred protection depends upon the severity of the subsequent infection.

J. Holles (Virch. Arch., 1913, Bd. 213, p. 380.):

"The descendants of the tuberculous inherit a certain degree of immunity. This thesis agrees also with our knowledge that the intensity of tuberculosis from generation to generation is diminishing. Laboratory investigations also speak for this; for example, F. Rosenkrantz, using the Bordet-Gengou reaction, demonstrated in 100 new-born infants, children of tuberculous mothers, the antibodies of tuberculosis 31 times.

"Spengler differentiates two kinds of immunity, the antitoxic and the lytic. The first develops for example in connection with tuberculin treatment. Here we can inject the largest doses of tuberculin without reaction. * * * On the other hand, the lytic immunity goes also with the highest grade of sensibility to the poison. The accumulated lysins dissolve the bacilli, in consequence of which the endotoxins set free develop the toxic symptoms. Later there develops a more complete kind of immunity. * * * *

"We may assume that the more sensitive the tuberculous patient is to the poison the more we can count on his relative immunity to tuberculosis. * * * *

"Congenital predisposition occurs also in every one descended from tubercle free parents. The healthy nursling and the healthy child may, however, in the case of infrequent and milder infection acquire a decided relative immunity to a more intense later infection. We must regard as especially predisposed those persons whose cells are incapable of producing immune bodies, or have this faculty much lessened."—(Trans.)

It is an experience not infrequently met with in treating pulmonary tuberculosis to see a patient who makes satisfactory progress up to a certain point, and who then, without apparent reason, ceases to make further progress, or even retrogrades in spite of the continuance of good hygienic conditions. Such a patient may suddenly develop an acute febrile condition, generally associated with a pleuritis, and be quite severely ill for a week or more. After the subsidence of this exacerbation, he will begin again to improve, and make progress far beyond what he had hitherto attained. It would seem that these exacerbations were necessary in these cases to rekindle the waning immunity in order to maintain continued improvement. I have found patients whose entire adult life seemed to consist of a series of these exacerbations and remissions of the disease. I have now under my care a man of 62 years, who has had a cough all his life, has always been delicate, but who has reared a family, and has lost astonishingly little time from his work. A Roentgen examination shows an extensive involvement of both lungs, with much fibrosis.

One of the most conspicuous instances of the apparent benefiial effect of an exacerbation in this disease is:

Case I.—A lady of 35, after several years of chronic illness, was found to have pulmonary tuberculosis with bacilli in her sputa. She was treated at a sanitarium for almost a year, and procured an arrest. She then moved to Washington, and obtained a position in a government department. She has gotten along quite well for the past five years. She has lost some time on account of recrudescences, but never enough to exceed the sick leave compatible with the retention of her position. After having been exceptionally well for several months, she submitted in the spring of 1913 to the universal vaccination against smallpox required by the government departments without first consulting me. The vaccination was positive, and was followed by a decided lowering of her tuberculous immunity. She did not do well during the following summer and autumn. During this autumn the hygienic conditions of the room where she worked were defective, and she had thrown upon her an additional strain incident to her changing her residence. About Christmas, 1913, she had a sharp exacerbation, lasting several days, and accompanied by hemoptysis, pleuritis, and a temperature reaching 105 degrees F. Since this time, now more than a year, she has had better health than at any time since she left the sanitarium.

The claim of Romer and his school that the tuberculous infection is necessary to maintain sufficient immunity to hold in check the tuberculous process seems to be borne out by the following cases which show the lighting up of another

focus on the subsidence of one present beforehand.

Case II.—In January, 1907, I was consulted by a lady of 23 years, who described herself as suffering from "nervousness," and being "run down." My examination of the chest led me to suspect the possibility of tuberculosis, but the findings were too vague to furnish a basis for a diagnosis. Incidentally she told me that she had an anal fistula. This was a small affair, and under surgical treatment it quickly healed. The last time I examined the fistula the sister of the patient who accompanied her to my office asked me if I were not afraid to cure the fistula. I asked why. She replied, "Because I have heard that if you healed up a fistula, it would cause consumption." I made light of the idea, and dismissed the patient. This incident occurred in February. Early in July following I was called to see this patient and found that she had just had a hemoptysis, and this was the beginning of three years of invalidism. The belief that the healing of an anal fistula (often a tuberculous lesion) would cause the development of pulmonary tuberculosis was new to me at that time, but inquiry made since has shown me that it is quite widespread.

Case III.—In July, 1909, a lady of 65 years was placed under my care, who gave a history of having suffered from "indigestion" for fifteen years. Her digestion was at all times weak, and from time to time she would suffer from more or less acute attacks. Her temperature curve suggested very strongly tuberculosis, and the clinical picture was that of a tuberculous ulceration of the bowels. This diagnosis was confirmed by the finding of tubercle bacilli in the mucous flakes contained in the stools. The chest examination showed evidences of an old healed tuberculosis of the lungs, but at this time there were no evidences of activity, nor was there any cough or expectoration.

This case was treated with small doses of tuberculin, and made an apparent recovery that was very flattering to both physician and patient. In seven weeks the intestinal symptoms had entirely subsided, and she was able to eat an ordinary diet with comfort. In the meanwhile she had gained much in weight and strength. She was preparing to leave the hospital when one morning she told me she had "taken cold" the preceding night. This "cold" was the beginning of an active pulmonary tuberculosis, which terminated her life two months later.

Case IV.—A young mulatto of 29 years was referred to me in February, 1913, by Dr. Jas. F. Mitchell. He had a history of long-standing fistula in ano, upon which Dr. Mitchell had successfully operated about a year previously. Subsequent to the operation, his health, which had up to that time been otherwise good, began to fail. Three weeks before coming to me he had begun to cough and expectorate. On examination I found him with a high fever, a florid infiltration of both upper lobes, and a profusion of bacilli in his sputa. I put him to bed in a well-ventilated room. The improvement made in his lung condition was astonishing. While he never was entirely free from some fever in the twenty-four hours, his cough and sweats ceased, his appetite returned and the toxic state was greatly lessened. As he was beginning to get out of doors he developed intestinal tuberculosis, from which he died in July, 1913. The symptoms and physical signs of activity of the lung process did not recur up to the time of his death.

Case V.—A young colored woman of 26 years presented herself with a typical tuberculous adenitis of the cervical region. Her general condition was good, but as she told me that the glands had recently been growing larger, I advised their surgical removal. She did not take my advice at that time, but fifteen months later she was operated on by Dr. W. F. Sowers. The surgical result was ideal, and there was never any recurrence of the cervical involvement. Four months later she developed an abdominal complex for which a laparotomy was performed, revealing tuberculous peritonitis. The surgical wound never completely healed, a small opening persisting which was plugged by omentum. This patient died six months after the operation of progressive emaciation and asthenia. She was singularly free throughout from reactive symptoms. She never had pain, cough, loss of appetite, or diarrhoea. Of course there was a terminal anorexia, and some distress associated with the act of dying. I never discovered fever in the few times that I visited her, and neither she nor her family thought she had much if any fever.

A postmortem examination of the abdominal cavity only was allowed. This revealed a moderate tuberculosis of the peritoneum, isolated tubercles of the spleen, and a diffuse necrosis of the liver without microscopic evidence of tubercle formation.

If the thesis proposed by Römer and his school (*i.e.*, that immunity toward tuberculosis is maintained only by actual infection with the tubercle bacillus) is upheld, a view that seems

to derive some support from the occurrence of such cases as those herein described, we are led to the seemingly paradoxical conclusion that in order to get well of tuberculosis, it is necessary to continue to have tuberculosis. The same idea has found epigrammatic expression in the formula, "once tuberculous, always tuberculous," illustrating the reaction of the present against the extravagant optimism which characterized the earlier stages of the campaign against this disease.

If this conception means discouragement and evil omen to the sufferers from tuberculosis (though this is not actually so much so as might appear at first sight), from the standpoint of society as a whole it may carry with it the prospect of the evolution of a racial immunity against the consequences of tuberculous infection. It would appear, indeed, that we are already far along the road toward this goal. In spite of an almost universal infection, relatively few of us suffer and die from its effects. The disease is not so severe nor so fatal with us as it was a hundred years ago, nor as it is today with virgin peoples.

Also, we face the inference that tuberculin therapy is without effect in limiting the activity of the tubercle bacilli within the body, and that the only good it can do is to increase the tolerance of the organism toward the noxious effects produced by the toxins of the disease.

Further, when considering the radical treatment of tuberculous lesions amenable to surgical removal, we must look beyond the immediate area involved, and consider the individual as a whole in selecting cases for operation, and in making a prognosis.

THE EARLY DIAGNOSIS OF TYPHOID FEVER: REFERENCE TO COMPLICATIONS.*

By Walter A. Weed, M.D.,
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Typhoid fever is a disease that is almost universally prevalent. It owes its principal dangers to its dissemmination and complications. Its dissemination may be almost completely obviated, and the number of its complications greatly reduced by early diagnosis. The importance of early diagnosis has not been appreciated in the past as it should have been by the rank and file of the profession.

It is in view of these prefatory truths that I am prompted to offer the following desultory remarks, and it is in a spirit of seeking knowledge that I dare to appear before this cultured audience of intelligent physicians, hoping to elicit a discussion from the distinguished internists and surgeons present, rather than pretending at anything original, or assuming to tell you anything about this common malady, with which you are not already familiar.

My purpose has been to discuss the subject in a brief and practical manner, and not in a theoretical or scientific way.

From a practical standpoint the question of early diagnosis is of much greater importance than an absolutely accurate diagnosis, but what we should desire to attain is both an early and accurate diagnosis.

Since the introduction of modern laboratory methods we should with their accurate application, together with the history of the case, and the usual clinical manifestations, be able to recognize practically every case of typhoid fever fairly early in its course. The early recognition of typhoid is important as regards the physician, the patient and the community. An early and accurate diagnosis places the doctor in a position to expect the confidence and co-operation of the patient, and to inspire confidence into the patient. Thus, the doctor is respected for his ability, the patient's strength and peace of mind conserved, proper prophylaxis and treatment instituted, and the community protected. In this advanced era of preventive medicine the early recognition of typhoid fever assumes enormous proportions, and is highly necessary in order to protect the public health. The time has passed when any practitioner is justified in making an early

*Read before the Jefferson County (Ala.) Medical Society, Birmingham, December 14, 1914.

diagnosis merely from the symptoms upon which we were taught to rely in years gone by.

In considering the clinical aspect of a suspected case of typhoid, probably the first thing that would come to our minds is the question of its prevalence in the community. This having been ascertained, the next suggestive feature would be the patient's age; remembering that typhoid fever is most frequently met with in young adults, and is comparatively rare in infancy, and in those past the age of forty. We would then pass on to the history of the case, and, briefly, would expect to find prodromal symptoms extending over a period of a week or ten days, such as headache, vague pains of the back and limbs, loss of appetite, possibly nausea, faint rigors and diarrhoea or constipation. As a rule the onset is gradual, and for ten days or two weeks there are lassitude and inaptitude for work, and not infrequently bleeding at the nose. There is generally a gradually rise of temperature, known as the step-ladder temperature, but sometimes the fever begins abruptly, following a distinct rigor. If seen during the first few days of the disease the eyes are bright and the cheeks flushed, but by the end of the first week we find the dull, heavy appearance of the eyes, so characteristic of the disease. The long, pointed tongue, brown in the middle with red edges, and the relatively slow dicrotic pulse are of definite clinical value. Ilio-coecal gurgling, especially on pressure, I have observed to be quite common in this disease.

With reference to the often vaunted rose-spots, I have been rather disappointed as to their clinical value, whether present or absent. The spleen may or may not be enlarged. My experience has been that typhoid fever may simulate quite a number of diseases in its incipiency, and that in its early stages it is very easy to confound with La Grippe, malaria, pneumonia and bronchitis, especially. Also, it may resemble appendicitis, acute enteritis, cerebro-spinal meningitis, salpingitis, tuberculous peritonitis and acute miliary tuberculosis, but practically all of these can be promptly eliminated if we go into a thorough laboratory diagnosis. So much for the clinical aspect. With reference to the laboratory diagnosis, the physician can avail himself of several procedures, the more important of which I will mention briefly, *viz*: The first and most accurate is that of blood-culture. The typhoid bacillus is present in the blood early in the disease—frequently during the first twenty-four hours, and possibly during the prodromal stage, and may be cultivated at any time during the first week of the disease. If the culture is made after the expiration of a week or ten days, the organism may not be found. In this event the next best procedure is the agglutination test, either microscopic or macroscopic.

If the patient has not already had typhoid at some previous time, the bacillus when demonstrated from a blood-culture is pathognomonic, and so far as I know is the only absolutely dependable evidence of typhoid fever. It is true that to make a blood-culture requires some laboratory skill, still it is not a very difficult matter, and with a little practice almost any intelligent physician should be able to do it. This affords us a means of making an accurate diagnosis in from one to three days, which can not be done by any other known method. As already stated, if the patient has been sick several days when the culture is made the effort may prove fruitless, and that the agglutination test is the next most reliable. If found positive it is of the greatest importance in making a diagnosis, but if found negative, it does not necessarily preclude the possibility of typhoid fever. That is, the presence or absence of the agglutinating power of the blood is not necessarily final, but taken together with the history of the case, and the clinical symptoms, it is indeed very suggestive, and makes it possible to make a fairly accurate diagnosis in practically every case. The agglutinating serum for the macroscopic identification of the bacillus typhosus as put up in sealed ampules is convenient and can be done by any doctor.

As to the diazo reaction: I believe it in a very great measure unreliable, almost if not

quite as the Russo reaction, still when taken together with the clinical symptoms and history I think it is a valuable link in the chain of diagnosis. The reaction is present in almost every case of typhoid, and usually early in the disease.

Osler says, "It is expected during the first week and is often seen from the third to the fourth day after the onset. It is commonly observed before the rash appears." As already stated the reaction is present in almost every case of typhoid, but its absence does not imply that the trouble is not enteric fever; also the reaction may be present in a number of acute febrile conditions, but the careful diagnostician can in most instances eliminate them by their clinical and bacteriological aspects. With reference to the blood count, absence of a leucocytosis in any febrile disease is strongly suggestive of typhoid. In a febrile condition a leucopenia of 5,000 is very indicative of typhoid fever, and is unusual in conditions that otherwise simulate it, while a leucocytosis above 9,000 is presumptive evidence against it.

As regards the complications of typhoid fever, it is only my intention to mention briefly two or three interesting examples that have arisen in my own practice. Probably the most interesting complication of typhoid fever is hemorrhage. In a limited experience of something like two hundred cases of typhoid fever, I have observed that hemorrhage of the intestine at some stage of the disease is not an infrequent complication, and while we look upon it as being serious, it is not necessarily fraught with alarming results, and that but few of the cases in which hemorrhage occurred resulted in perforation or fatal peritonitis. One case especially I wish to mention in order to impress upon you the importance of more thorough investigation and early diagnosis in a suspected case of typhoid fever, *viz*:

R. C., male, white, age 20. Prodromal symptoms but little apparent. Temperature from 99 F. to 100 F. That is, it was an ambulatory type of typhoid, to which I paid but little attention. Suddenly on the tenth day after I first saw him he had a very copious hemorrhage, which was followed two days later by another large hemorrhage. After a tedious convalescence he made a good recovery. Had an early diagnosis been made in this case and proper care been enforced, I believe the chances are that this complication might have been averted, and a more speedy recovery expected.

The next complication of importance was a case of osteo-myelitis of the femur about six inches above the knee in a boy of twelve years. The osteo-myelitis did not appear until about four months after the convalescence from typhoid. The diseased part of the bone was thoroughly removed, the cavity cleansed, and allowed to heal by granulation. No vaccine was used and he made a splendid recovery.

The next important complication encountered was an intestinal perforation occurring during the third week of the disease.

R. N., male, white, age 28 years. Pervious history negative. First consulted me on April 12, 1914. A diagnosis of typhoid fever was soon made and treatment instituted. On the fourteenth day he had a moderate hemorrhage, and on the seventeenth day following a small hemorrhage appeared a typical picture of perforation. He was removed to the Birmingham Infirmary within four hours after the perforation occurred, and was referred to Dr. Gewin for operation. We found an oval-shaped perforation in the ilium about seven inches from the ilio-coecal juncture about half an inch in diameter, which was closed with purse-string suture, reinforced by Lembert sutures. After the operation we thought that death was imminent owing to the extreme shock and collapse, and for about two days he seemed to be in desperate straights, after which he made a slow but uninterrupted recovery.

In one case a typhoid appendicitis developed during the second week. This patient, a little negro girl, was sent to the Hillman Hospital, after considerable procrastination on part of the parents. I understood that she was operated on, but died as a result of the waiting policy.

In closing my remarks I wish to emphasize the importance of the early recognition of typhoid fever for reasons already stated. Every suspected case should be isolated, and treated under precautions until an accurate diagnosis can be made; and every known method which we are capable of performing should be utilized

in the making of the diagnosis. This having been done, we will have the consciousness of a duty well performed, and in so doing will have guarded our professional reputations, our patients' interests and our public health.

500 Tuscaloosa Avenue.

THREE GROUPS OF LATE SYPHILIS.*

By James H. Smith, M.D., and Wm. B. Porter, M.D.,
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Between 1903 and 1909, Metchnikoff transmitted syphilis to monkeys; Schaudinn described the treponema pallidum; Wassermann showed how to detect the body at work against the toxins of this organism, and Ehrlich fashioned a weapon most effective against the spirochete when it can be reached. The succeeding years have served to show its elusiveness and some of its favorite hiding places. To hunt out these retreats is the work of the pathologist. Prophylaxis against such tendencies is mainly up to the specialist in syphilis. It is for the general practitioner and internist to be keenly alive to the failures of early diagnosis and treatment, to know the obscure haunts of the spirochete, that when evidence arises of disease seated in these parts, he may be quick to indict the true cause. Otherwise, we may conduct a vain fight against structural or functional fault, ignoring a persistent causative factor, often remediable.

After Schaudinn and Wassermann, the old classification breaks down. Early clinicians, indeed, warned against a too literal acceptance of the terms primary, secondary and tertiary. But they trusted too implicitly the non-infectious character of the gumma. Their conception was that these late manifestations were sequences only and not syphilis itself. They were the trail of the serpent. Nowadays, no matter how old the trail, we are not surprised to find a nest of spirochetes somewhere. Like in the fable of the frozen viper that the man took into his bosom, they may be comparatively inactive. But when the viper was warmed it stung the man, and we are chary of what the dormant spirochete may do. Parasyphilis has little meaning in the prefix, since Noguchi and Moore have demonstrated the organism in the paretic's brain and in the tabetic's cord. Persistence is its habit.

Again, it works hard and fast. Harlow Brooks reports two cases at autopsy six months after the primary lesion, dead of aortic aneurysm. He cites another "dead before the secondary rash had fully appeared," the postmortem examination showing unmistakable syphilitic changes in the heart wall and aorta. The lapse of time between infection and the appearance of symptoms is material, for sclerosis is roughly proportionate. But the fact of syphilis and its anatomical location are all important.

We want to call attention to three forms of late syphilis. In these, to a considerable extent, our own shortcomings have led us to believe we are most likely to err:

1. The diagnosis of syphilis of the liver.
2. The diagnosis of syphilis of the heart and aorta.
3. The diagnosis and treatment of syphilis of the brain and cord.

Failures to recognize hepatic and cardiac syphilis must be due largely to a blind spot in our thinking, and this to a corresponding gap in our knowledge. For, though the Wassermann test is not infallible, it is reliable in about 80 per cent of these cases. Broadly speaking, we need to appreciate the mimicry of both medical and surgical conditions by hepatic syphilis; the frequency of cardiac syphilis, and the limitations of the blood Wassermann reaction in cerebro-spinal syphilis.

SYPHILIS OF THE LIVER.

The picture of cirrhosis, cancer and bile-tract infection may each be closely simulated by syphilis of the liver.

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*Read before the Richmond, Va., Academy of Medicine and Surgery, Oct. 13, 1914.

[1]Am. Jour. Med. Sci., CXLVI, p. 513.

(a) The uniformly enlarged liver due to syphilis may resemble cirrhosis[2] in the characteristics of the enlargement, the age of the patient, vomiting and other digestive symptoms, including hematemesis and melena, splenic enlargement, ascites and jaundice. In both the male sex preponderates, and most cases of syphilis of the liver are alcoholics.[3]

(b) The nodular type, presenting a palpable tumor, cannot be distinguished from cancer by the age of the patient, emaciation, anemia, pain or tenderness, or the size or shape of the tumor. If there is any significant clinical difference it is in the distinct predilection of gummata for the left lobe of the liver, the tumor usually presenting to the left of the median line.

(c) The febrile type may resemble bile-tract infection in the chills, leucocytosis, paroxysmal pain and tenderness, the digestive symptoms, and the chronic, intermittent, recurrent clinical course.

Or the syphilitic liver may present a picture assembled from cirrhosis, cancer and gallstones; or may suggest liver abscess, Banti's disease or splenic anemia. In short, it may be as chronic as hypertrophic cirrhosis or as acute as appendicitis, as insidious as cancer or as boisterous as biliary colic.

In hepatic syphilis symptoms appear on the average about eleven years after infection. In Dr. Edward McGuire's clinic last winter we had a girl aged 12 with syphilis of the liver, almost certainly late congenital.

The actual invasion of the liver by spirochetes probably occurs very early. At the dispensary of the Medical College of Virginia we saw a colored man, aged 22, with history of a sore two months previously. Dr. Hopkins demonstrated spirochetes from mucous patches in the mouth. The conjunctivae were bile-stained to an extreme degree. The icterus promptly disappeared under treatment. We are more inclined to think the liver harbored spirochetes than that it was influenced simply by toxins.

With the aid of the Wassermann reaction, the patient's history, and collateral signs of old syphilis, the diagnosis of hepatic syphilis is comparatively easy, provided only we do not forget it.

The prognosis depends upon the amount of permanent sclerotic change. It is better than that of any disease it is likely to simulate. Potassium iodide alone is often adequate for complete relief from symptoms. It is safer to use mercury also. Salvarsan seems to add but little in the way of results.

SYPHILIS OF THE AORTA AND HEART.

In recent years no condition has risen in the scale of clinical importance more than syphilis of the aorta and heart. In the extent of its ravages it surpasses hookworm in the South; measured either by incidence or amenability to treatment, it far outweighs pellagra.

In 1906, Stengel[4] wrote: "Syphilis (of the heart) is rare, but may occur in the form of gumma or diffuse infiltration." Babcock,[5] in 1908, said: "Heart syphilis is far less often recognized clinically than postmortem." But in 1913, Harlow Brooks[1] states: "Serious involvement of the heart is frequent in syphilis," and Warthin,[6] after a study of 200 syphilitic hearts, says: "My own experience would make make me believe that syphilis, both congenital and acquired, is the most important etiological factor in the production of cardiac disease, both myocardial and endocardial."

In aortic syphilis the average time for the appearance of symptoms of circulatory disease is seventeen years after infection. In reality a very early invasion of the aorta is probable.

The syphilitic heart may present no signs to distinguish it from an endocarditis of bacterial origin, or from sclerosis. Nevertheless,

[2]Cheney: Am. Jour. Med. Sci., CXLVIII, p. 157.
[3]McCrae: Am. Jour. Med. Sci., CXLIV, p. 625.
[4]Stengel: Text-book of Pathology.
[5]Osler's System, IV, p. 126.
[6]Am. Jour. Med. Sci., CXLVII, p. 672.

the following averages deserve almost to rank as principles:[7] [12]

1. Lesions involving the mitral valve only are more often rheumatic than syphilitic.

2. Lesions involving only one valve, and that the aortic, are more often syphilitic than rheumatic.[8] They are usually associated with syphilitic aortitis.[9]

3. Pure aortic stenosis is practically unknown.[12] Given the pure systolic murmur suggesting aortic stenosis, it means:

(a) Sclerosis (dilatation) of the aorta, which may be, pathologically, syphilitic aortitis, or may be non-syphilitic; or such a murmur indicates:

(b) Aortic stenosis accompanied by regurgitation, though no diastolic murmur is audible. If the pulse pressure is very wide, regurgitation is almost certainly present.

4. Pure aortic regurgitation in young people is nearly always syphilitic; in persons past 40 it is frequently due to non-syphilitic sclerosis.

5. Combined aortic and mitral lesions are not usually syphilitic.[10] They are more likely to be so when:

(a) There is no definite history of acute articular rheumatism, or

(b) When dilatation of the heart is marked, with a relative insufficiency as a probable explanation of the mitral lesion.

They are least likely to be syphilitic when mitral stenosis is present. Mitral stenosis is the characteristic lesion of rheumatic origin.

6. Ninety per cent of aortic aneurysms are syphilitic and give a positive Wassermann reaction.[11]

In adults we believe a positive Wassermann reaction will explain as many cases of chronic cardio-vascular disease as will a history of rheumatism, tonsilitis or chorea. When the aortic area alone gives physical signs, or when it is implicated along with the mitral valve, but without any apparent cause, syphilis must be considered. If the area of percussion dullness over the aorta is increased, the suspicion is strengthened. An X-ray picture of the aorta and heart is of great assistance in a case suspected of aortic involvement. A febrile course is no sort of evidence against syphilitic aortitis. Among symptoms, recurrent pain, precordial or anginal, and paroxysmal dyspnea coming on after or independent of exertion, are somewhat characteristic. Pain is apt to be more marked and dyspnea more sudden and severe in syphilitic cases than in those of other origin. The Wassermann reaction is positive in 80 to 90 per cent of cases of cardio-vascular syphilis.

The prognosis depends upon the amount of sclerosis, degeneration and decompensation. It is vastly better if the etiological factor is treated along with the visceral derangement. These cases are, however, primarily circulatory, secondarily syphilitic. Treatment should be regulated accordingly; first cardiac therapy, then luetic. Mercury and potassium iodide are practically always indicated. Salvarsan, persistently used, may relieve some of the most troublesome symptoms. For a day or two, however, pain and dyspnea may be aggravated by its use.

SYPHILIS OF THE BRAIN AND CORD.

In the diagnosis of syphilis of the brain or cord, we possess advantages we do not have in dealing with late manifestations of the disease elsewhere.

First, there is a keener apprehension of the liability of these parts to the infection.

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[7] In three series of cases, Longcope (Arch. Int. Med., Vol. II, p. 14) determined the following percentages:

	Cases.
(1) Aortic regurgitation, clinically	47
[a] Positive Wasserman	35 (74.4%)
(2) Aortic regurgitation, clinically	43
Autopsy: Aortic valve only involved in	22
[b] Syphilitic aortitis	18 (81.5%)
Autopsy: Retraction or stenosis of mitral valve along with aortic involvment—principally children with history of rheumatic fever	21
[b] Syphilitic aortitis	0
(3) Aneurysm, clinically	12
[a] Positive Wasserman	11 (91.7%)

[12] Cf. also the writings of Dr. Richard C. Cabot.

Second, in the accessibility of the cerebro-spinal fluid for examination:

(a) By the complement-fixation test.

(b) Determination of the globulin content.

(c) Increase in mononuclear cells.

(d) Pressure under which the fluid escapes.

(e) Failure of the fluid to reduce Fehling's solution.

(f) The colloidal gold reaction.

The idea of syphilis in association with neurological conditions is constitutional with the profession. As an explanation of cardiac symptoms, syphilis may be stowed away in the mind's attic, but it is at the door to meet paralysis, ataxia, cranial nerve palsies and the like. We are, indeed, rather prone to magnify the 10 to 20 per cent of cases in which the relationship is real. But it is a wholesome attitude. For, given involvement of the central nerve axis, it is most amenable to treatment when syphilitic.

In early syphilis the brain is much more frequently affected than the cord. One-half the early cases occur in the first three years after infection. The incidence is greatest in the first year, less in the second, and still less in the third.[13]

When suspicion of nerve syphilis arises, perhaps our chief liability to err is in a negative Wassermann reaction of the blood. We should expect a negative result in about one out of five cases. The 20 per cent margin of error is much contracted by the evidence to be obtained through lumbar puncture. In early and late lesions, in paresis and tabes, the characteristics of the cerebro-spinal fluid are the same. They prove syphilis of the brain or cord. Between the forms of central nerve syphilis other data must guide.

There is as yet no agreement among pathologists as to what proportion of cases present positive complement-fixation in the fluid and at the same time negative blood reactions. It is certain, however, that it not infrequently happens. Moreover, the different data furnished by the spinal fluid itself, though closely concurrent in their total averages, may speak, one sign in one patient and a different sign in another. When the globulin reaction is positive, we expect the mononuclears to be increased and the Wassermann reaction to be positive. But it may not be so. The discrepancies may make a knotty problem in pathology, but they tighten the diagnostic dragnet.[14]

The Wassermann reaction is, for practical purposes, specific, as it is in the blood. It requires the same skilled technique as does the serum examination.

The Noguchi (butyric acid) globulin test is very simple in technique.[15] It has only the general pathological significance of meningeal inflammation.

Cytological examination of the spinal fluid can be made by anyone prepared to make an ordinary leucocyte count.[16] The common causes of mononuclear cell increase are syphilis and tuberculous meningitis.[17]

Increased pressure and the failure to re-

[13]Gotthell: Progressive Medicine, September, 1913, p. 140.

[14]The comparison of percentages from different writers is made difficult by variations in technique, in clinical standards, and in the emphasis placed upon autopsy findings. It seems that the highest percentage of positive Wassermann reactions is obtained by using the cholesterinized heart muscle preparations as antigens, and in the case of the cerebro-spinal fluid a comparatively large amount of the fluid. There is some tendency on the part of pathologists, however, to question the validity of such technique. (See Thomas and Ivy, Am. Jour. Med. Sci., CXLVIII, p. 55.)

The variations referred to contribute somewhat to the differences observed in the following table:

	WASSERMANN			
	Blood	C-S Fluid	Increased Globulin	Cell Excess
Collins & Armour:*				
Cer.-Spin. Syph.	88	43	86	70
Tabes	66	41	33	60
Paresis	100	92	86	71
Lee & Hinton:†				
Cer.-Spin. Syph.)				
Tabes .....)	43	59	77	63
Paresis .....)				
Nonne:‡				
Cer.-Spin. Syph.	80-90	almost all	almost all	almost all
Tabes	60-70	100	55	55
Paresis	100	90+	95	95

*Jour. Am. Med. Asso., June 22, 1912, p. 1918.
†Am. Jour. Med. Sci., CXLVIII, p. 33.
‡Progressive Medicine, Sept., 1913, p. 265.

duce Fehling's solution are of general import only.

The collodial gold reaction seems to possess in large measure the two cardinal virtues of any test: a reaction typical for syphilis and a constancy of very high degree.[18] For the present, at least, its technique will limit its employment to a few highly trained laboratory workers.

All told, the Wassermann done on the blood and on the cerebro-spinal fluid, the globulin reaction and the cell count will suffice for the diagnosis in more than 90 per cent of cases. A careful clinical judgment will occasionally set aside negative results in each and all of these examinations. The benefit of the doubt should not be withheld from any individual.

In the treatment of these syphilitic nerve lesions, a distinct advance has been made in the intra-spinous injection of salvarsanized serum after the method of Swift and Ellis. In an accompanying paper we report the results in our cases.

In discussing these three groups of cases it may seem that emphasis has been laid upon the old-fashioned methods of treatment, somewhat to the neglect of the new. We think, though, that the relative valuation is just. For we are dealing mainly with old, deep-seated, sluggish pathology. Salvarsan is like cavalry in the dash and brilliancy of its attack. Like cavalry, too, its value is greatest when it can surprise the enemy in unintrenched positions. The treatment of a case of syphilis is not a movement, but a campaign. In the late stages especially we need drugs of weight and endurance. Salvarsan by any method, in syphilis anywhere, is not so strong a staff to lean upon that mecury may be shelved, or the iodides despised.

[18]Reagents: I. 10% solution of butyric acid in normal saline. II. Normal sodium hydrate.

Cerebro-spinal fluid, 1 part, and butyric acid solution, 5 parts, are mixed and heated. The reaction may occur at this point, as described below. Normal sodium hydrate, 1 part, is added, and the mixture again heated. Reaction: a heavy, white precipitate forms and settles immediately if the reaction is strong—within a half hour at the most. A slight cloudiness will form and precipitate after a long period with normal fluid.

Nonne's test consists of a contact protein ring, using equal parts of the fluid and a saturated solution of ammonium sulphate. Its significance is the same as the butyric acid test.

[16]Staining fluid:*

Methyl violet	0.1 part
Acetic acid	2.0 parts
Water	50.0 parts

Fill about half the lumen of "white" pipette with staining fluid and draw the bulb full of the cerebro-spinal fluid. No account need be taken of the slight dilution. The count is made in the ordinary leucocyte counting chamber. It should be made immediately following lumbar puncture. Five or ten chambers should be counted. A count of over 10 cells per cu. m. m. is abnormal. Usually the type of cell can be recognized in the counting chamber. A differential count may be made on a slide or a cover glass, stained with methylene blue or Jenner's stain, as in the examination of blood. It may be necessary to fix the specimen in egg albumin.

*Ayer: Boston Med. & Surg. Jour., CLXX, p. 452.

[17]Carcinoma in this location is very rare and chiefly late metastatic in occurrence.

Herpes zoster sometimes gives a mononuclear excess, but it is a legitimate question whether the spinal root pathology in these cases may not be, in reality, syphilis..

An increased mononuclear count has been occasionally noted in uremia and is not uncommon in mumps.

[18]Lee and Hinton: Am. Jour. Med. Sci., CXLVIII, p. 33.

TREATMENT OF SYPHILIS OF THE CENTRAL NERVOUS SYSTEM, WITH REPORT OF CASES.*

By Wm. B. Porter, M.D., and Jas. H. Smith, M.D., Richmond, Va.

When syphilis involves the cerebro-spinal axis, physicians realize that a condition exists which is always resistant to treatment. Symptomatic relief not infrequently is obtained from trifling medication, but the careful clinician realizes that a cure has not been accomplished. In fact, the feeling has come to be a certainty that this form of syphilis, more than any other, does not die, but sleeps, to awaken with re-

*Read before the Richmond, Va., Academy of Medicine and Surgery, October 13, 1914.

newed vigor after a varying period of quiescence. It is during this period of apparent clinical quiescence that degeneration of nerve structure or pressure from syphilitic hyperplasia occurs, later revealing its activity and progress by paralysis of some of the cranial nerves, by the lancinating pains of tabes, or by the mental degeneration of paresis.

These manifestations of central nerve involvement were considered as parasyphilitic affections and not amenable to the usual antisyphilitic treatment.

When Noguchi and Moore demonstrated the spirocheta pallida in the brain and spinal cord of cases of paresis and tabes, the parasyphilitic wraith forever vanished and the syphilogenous nature of these conditions was revealed. In these cases the findings in the spinal fluid represent in a degree the ravages of the pale spirochete on the investments and substance of the central nervous system. At this point we began to look upon the so-called parasyphilitic diseases in a new light, and to realize that in their pathology we see the workshop of one of the same family of spirochetes that formerly brought the patient to his physician, with possibly a trivial sore on his penis.

The inaccessibility of the spirochetes in these cases to remedies administered through the general circulation may be explained by the limited communication between the general circulation and the spinal fluid. This is emphasized by the very small number of substances recovered from this fluid after the entrance of such substances into the general circulation. Recently Engman, Bughman, Gerhman and Davis tried to detect arsenic in the spinal fluid after the intravenous injection of neo-salvarsan, with invariably negative results. We are all familiar with the negative results when antimeningococcus serum is given in any way except subdurally: for in this latter way alone does a sufficient amount of the serum come in contact with the organism to have any bactericidal power.

A rather interesting sidelight on this question is a recent contribution by Flexner and Amos. Their experiments consisted in the intravenous injection of poliomyelitic cerebrospinal fluid. The results supported the hypothesis that all infections of the central nervous system in man occur through the medium of the spinal fluid. Time for such infection is required, since the barrier, the choroid plexus, must first be overcome. In their experience seventy-two hours were required for the virus to begin its passage into the spinal fluid. It then remained active in the cerebro-spinal fluid nineteen days after injection; but in the blood was active only nine days. We not infrequently see an analagous condition in syphilis, a negative Wassermann in the blood, and a positive reaction in the spinal fluid. It is hard to realize that there is such poor communication between these two body fluids as to make such a serological condition possible, yet it is an established fact.

New hope in these resistant types of syphilis dawned when Ehrlich first published his results in the treatment of this disease with salvarsan. These hopes and expectations were soon shaken by clinical evidence of repeated failures. For even with increasing dosage and repeated injections there still remained very little benefit in the majority of cases of tabes and paresis and other types of late cerebrospinal syphilitic infections. The necessity of attacking these infections of the cerebro-spinal axis more directly, through the medium of the spinal fluid, was soon recognized. Wachselman attempted the intraspinal injection of weak solutions of salvarsan, 1-500 and 1-1000, in dogs, but found the reactions very severe, producing in them convulsions, weakness in the limbs, and, in many instances, death.

Early in the history of salvarsan therapy Ehrlich pointed out that salvarsan was active only in the presence of serum and was not a spirocheticide in any other combination. The studies of Plaut showed that the serum of patients who had taken salvarsan had definite antisyphilitic properties. Swift and Ellis found that salvarsanized serum had an inhibitory action on cultures of spirochetes, and also

found that heating the serum at 56 degrees for half an hour markedly increased this activity. They concluded that the increased activity was due to the destruction of inhibiting substances and that the spinal fluid did not possess these inhibitory bodies.

Presupposing living spirochetes, harbored in the lymph, perivascular spaces, and the interstitial tissues of the brain and spinal cord, Swift and Ellis, two years ago, began the subdural injection of salvarsanized serum. Cases of tabes and paresis were selected by them as the types most refractory to treatment by any previous method. The report of their results was encouraging, not only because of clinical improvement but also in the definite cytologic and serologic changes in the spinal fluid. Since their original report, other observers have reported therapeutic results entirely unattainable by other known methods. The number of cases treated approximates one thousand and we are especially impressed with the uniformly good results and the few untoward symptoms that have occurred during or after its administration.

During the past year we have had under observation and treatment four patients and the results obtained in these cases appear to justify a somewhat detailed consideration of the same. They include:

1. Early Tabes (Wassermann positive).
2. Paralysis Agitans (Wassermann positive in blood and spinal fluid).
3. Tabeto-Paresis (Wassermann positive in spinal fluid).
4. Para-Myoclonus Multiplex (Wassermann positive in blood and spinal fluid).

In the first two cases we followed the original technique of Swift and Ellis. We have now modified the technique somewhat, and feel that this modification simplifies the process. Instead of using 12 c.c. of serum, we use all that can be obtained from 40 c.c. of blood, withdrawn one hour after the intravenous injection of 0.6 gram salvarsan. Prior to the subdural injection of the serum withdraw 30 c.c. of spinal fluid. Instead of diluting the serum with saline, we dilute with as much of the spinal fluid as is necessary to make the total volume equal the amount of spinal fluid withdrawn. In eliminating the saline we do away with a possible source of contamination as well as simplify the technique.

Case 1. Early Tabes.—Mr. G., white, male, 51 years, single, school teacher. Initial lesion 31 years ago; three months treatment. Chief complaint, cushion sensation in soles of feet, as though he were walking on a felt mattress. Accustomed to walking five miles without fatigue, but for the past two years tires easily; sharp, lancinating pains in the legs; these are increasing in frequency and severity; unsteadiness while walking, especially noticeable at night.

Phys. Exam.: Well nourished, intelligent man; typical Argyle-Robertson pupil; knee and Achilles jerks absent; hypotonus of legs; slight Rhomberg; no apparent disturbance of gait.

Wassermann, strongly positive.

Spinal fluid: Cell count, 60; 100 per cent lymphocytes.

Globulin, strongly positive.

Wassermann, strongly positive.

This patient received four intravenous injections of 0.6 gram salvarsan with four subdural injections of salvarsanized serum. The treatments were given every three weeks. The lightning pains and cushion sensations in his feet were entirely relieved; the spinal fluid cell count was reduced to 6 (normal), and the Wassermann became negative.

Case 2.—Paralysis Agitans. J. W., white, male, 57 years, traveling man and farmer. Initial lesion 30 years ago, four months anti-syphilitic treatment; four years ago began with a tremor in hands which has progressively increased; uses his hands with difficulty, especially when he attempts to write. It is hard for him to start a muscular movement, but once started can be more easily stopped; difficulty in walking, especially in ascending steps; has frequently run into people because of difficulty in stopping; retropulsion on attempting to arise from a chair; hand-writing has entirely changed until it is now with difficulty that he is able to write legibly. His legs feel stiff and he has difficulty in walking, espe-

We wish to express our appreciation to Dr. W. W. Dunn for the opportunity of studying Case 1, and to Dr. Call for Cases 2, 3 and 4.

cially at night; memory is failing; frequently miscalls names and words; speech has changed during the past two years, is more deliberate and monotonous; occasional cramps in legs and arms; slight vertigo at times.

Phys. Exam.: Rather typical mask like facies; speech monotonous and deliberate; characteristic position of hands and arms with the tremor of Parkinson's Disease; definite hypertonus of the muscles of the extremities with slowness of movement. When arising from a chair he hesitates, then starts ahead in a direct line, his laggard legs trying to keep up with the forward-leaning body.

Pupils normal; reflexes exaggerated; no Babinski, ankle clonus or Rhomberg.

Wassermann positive in the blood and spinal fluid.

Five intravenous injections of 0.6 salvarsan were given with five subdural injections of salvarsanized serum. With the first subdural injection the patient had marked meningeal irritation, chill and elevated temperature; this passed off in ten hours. There was definite improvement in his tremor; has gained in weight and the expression of his face became more natural with a corresponding increase in the acuity of his intellect. Second Wassermann not made.

Case 3.—Tabeto-Paresis. W. P. C., white, male, 33, salesman, single. Initial lesion 14 years ago; three years anti-syphilitic treatment. Nervousness for the past six months with insomnia and weakness; aphonia when he becomes nervous, with tremor of lips and hands; unable to do work satisfactorily; sharp, stabbing pains in arms and legs, occurring every ten days or two weeks; employers have noticed change in disposition and marked irritability.

Phys. Exam.: Patient nervous and irritable; speech tremulous with occasional aphonia; attention hard to fix; right pupil reacts to accommodation, not to light; left pupil fixed in dilitation; tendon reflexes, upper and lower extremities, absent.

Spinal fluid: Cell count, 70, 100 per cent lymphocytes.

Globulin, strongly positive.

Wassermann, positive.

This patient received six intravenous injections of 0.6 gram salvarsan, with six subdural injections of salvarsanized serum. The first four were given at two weeks intervals; the next two at month intervals. The patient has gained eleven pounds in weight; his nervousness has disappeared and he sleeps well; the pains and aphonia were absent after the fourth treatment and have remained so. His expression is bright; and he says he feels more like himself than he has for five years; his spinal fluid is normal except for an abnormal globulin reaction.

Case 4.—Para-Myoclonus Multiplex. J. C. C., white, male, single, 23, merchant. Initial lesion eight years ago; no treatment. This patient was admitted to the hospital on September 6, 1914. Four days prior to admission he began to have dizziness, staggering gait, some nausea and vomited once; marked photophobia; no headache; within 24 hours he developed constant, multiple, clonic contractions of all the muscle groups of his body, with marked rigidity of his neck; his sight was disturbed by a constant nystagmus and his speech by the tremor of his tongue. It was with difficulty that he remained in bed because of the constant and violent muscular contractions. Insomnia was marked. There were at no time convulsions or headache.

Phys. Exam.: Patient very nervous, with constant clonic contractions of all muscles, more marked in the upper extremities, neck and back; pupils dilated; do not react to light or accommodation; constant nystagmus; tremor of the tongue; neck quite rigid; reflexes markedly exaggerated; Babinski slight on the left, absent on the right; no paralysis of any muscle or muscle group; eye grounds normal.

Blood: Wassermann strongly positive.

Spinal Fluid: Cell count, 80; 98 per cent lymphocytes, 2 per cent polys.

Globulin reaction positive.

Wassermann strongly positive.

This patient received six intravenous injections of 0.6 grams salvarsan, with six subdural injections of salvarsanized serum. The first four injections were given at the rate of two per week, the fifth after one week interval, and the sixth after an interval of two weeks.

Definite improvement was manifest after the second treatment and has been progressive; the muscular contractions have entirely disappeared except when he exerts himself; these are slight and confined only to the muscles of his neck and back; his pupils react normally; the nystagmus has disappeared and his reflexes are normal. The spinal fluid on October 8, 1914, showed a cell count of 8. Wassermann was not made.

The first case was in every respect an ideal patient for treatment. He was in the preataxic stage of tabes. The elimination of lightning pains and cushion sensations in his feet made him for all practical purposes a normal man.

Regardless of the benefit and apparent cure he received from four injections, we feel that he needs further treatment and should be kept under periodic observation. The spinal fluid should be examined at least once in every three months and, with any evidence of relapse, treatment should be resumed.

Case 2 was largely an experiment. Paralysis Agitans is a disease of unknown pathology. Its relation to a syphilitic infection in this instance may have been a coincidence, nevertheless he did have evidence of systemic and cerebro-spinal syphilis and the treatment was aimed at this with the hope that the palsy would be benefitted. We, as well as the patient, feel that the results justify the course pursued.

Case 3 was also an ideal case for permanent relief. An early case with the pathology not far advanced, it might be spoken of as one in the irritative stage of tabeto-paresis and not advanced to the stage of marked degenerative pathology. The results in this case seem to justify this conclusion.

Case 4 was of peculiar interest in that it was a very unusual manifestation of central nervous syphilis; we have never seen a similar case or been able to find one reported in literature. Kaplan, in his recent book on Serology of Nervous Diseases, knows of no case in which serologic work has been done on this disease. We have called it Para-Myoclonus Multiplex because this was the most apparent clinical manifestation of the infection. The transformation in this case from a patient almost unable to stay in bed on account of muscular contractions to one who is perfectly composed while lying in bed is a very striking result. He still has some muscular jerkings when he attempts to sit up, but these are gradually disappearing. He is still under treatment.

Conclusions:

1. Admitting the psychological effect of any new treatment on this class of patients, we feel that the clinical improvement and the cyto and serologic evidence are strongly conclusive of the definite therapeutic value of salvarsanized serum.

2. The procedure is time consuming and requires aseptic care, but each step is comparatively simple and, carefully done, is without any special dangers.

3. The modification we have been using does simplify the process and eliminates one possible source of contamination.

4. The reduction in the cell count and improvement in Wassermann usually run parallel. The failure in the reduction of the globulin reaction at times is probably due to the large amount of this substance introduced with each treatment.

5. Our experience in the examination of cerebro-spinal fluids has led us to the conclusion that no case of syphilis should be discharged without a negative examination of the spinal fluid as well as of the blood.

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9. Flexner and Amos. Jour. Exp. Med., Apr. 1, 1914, p. 241.

10. Kaplan: Serology of Nervous Diseases.

AUTHORS' ABSTRACTS.

Medicine.

Causes of Insanity and its Prevention. By Chas. L. Gregory, Greenville, Texas. Pan-American Surgical and Medical Journal, February, 1915, pp. 15-18.

The author believes that proper care and treatment for the mentally sick can only be had in a properly equipped sanitorium devoted exclusively to such cases. In acute cases confinement in bed is desirable. For insomnia, mental or motor excitement give duboisin, 1-100 grain hypodermatically or hyoscine hydrobromate, 1-100. Hot bath from thirty to sixty minutes often effectual. Early treatment essential. During six years at Pavilion Sanitarium, New York, of 1,038 cases only 183 finally sent to insane hospitals. Remainder resumed vocations. Causes: First, alcohol, a stimulant poison; second, heredity and syphilis. Several instances of inherited insanity through successive generations. Syphilis is the cause of 75 to 80 per cent of paretics and 95 per cent of locomotor ataxia.

There are in state hospitals for insane 10,000 young men from "sowing wild oats." At the door of every saloon and immoral resort might truthfully be written: **Incurable Insanity May be Contracted Here.** As a preventive of insanity sterilization, carefully regulated by law, is recommended. Much good can be done by segregation of every case of defective mind or body. If the germ plasms inherited from father and mother are vitiated and below par, the resultant being cannot be hale, physically and mentally. We must overcome the alarming prevalence of unsoundness of mind. Provide that children be born with sound bodies and brains. The masses must be educated by lectures. Segregate the unfit and restrain their marriage by law. Sterilize all subjects suffering with insanity and habitual drunkenness.

Studies in Fat Indigestion. By C. H. Dunn, Boston, Mass. American Journal of Diseases of Children, March, 1915.

The cases studied at the Infants' Hospital were those which showed a marked intolerance of cow's milk fat, manifesting itself by showing signs either of failure of fat absorption, or failure of digestion, or of both. Chronic disease, particularly tuberculosis, was found associated with these cases with marked frequency. In the study of previous feeding, overfeeding with carbohydrate was found the history, rather than overfeeding with fat. We can only, to a very slight extent, successfully compensate for deficient power to digest and absorb fat by increasing carbohydrate or protein. The microchemical examination of the stools for fat is indispensable for the proper management of these cases. In general babies who cannot gain weight on a certain percentage of fat with lactose can gain better on the same percentage of fat when maltose is substiuted. The use of maltose does not actually increase the power of digesting and absorbing fat. As to the relative values of precipitated casein and unmodified protein in these cases, the evidence was contradictory and not conclusive. Fat "blowups" occurred with the same quantity of fat in cases where both forms of protein were successfully used. Some cases did better with precipitated casein, but in no case did its use show clear evidence of increasing the power of digesting and absorbing fat.

In general the milk modifications used must be low in fat, average in carbohydrate, comparatively high in protein. The extra sugar should be maltose. Severe resistant cases can only be saved by human milk.

Radioactivity of Mineral Waters of Hot Springs and Warm Springs and Healing Springs in Hot Springs, Va. By J. C. Hemmeter and E. Zueblin, Baltimore, Md. Archives of Internal Medicine, February, 1915.

Brings short review of different natural, artificial radiations (rad. act minerals, waters, gas, air) technic for detection, calculation of radioactivity, own technic adopted for waters (at spring itself, bottled, in laboratory, after standing) sediments, gas etc.; comparison with other quantitative analyses, domestic and abroad. Writers emphasize necessity of very careful technic, no slipshod method reliable, only personal training and thoroughness give satisfactory results, particularly in determination of radioactive gas by complex method. Rapid loss of emanation inevitable, even when all precautions taken in collecting sample (No. 12-13, 85, 6 per cent in 6), necessity patient must consume water immediately at spring itself, transportation means quick loss. Results from 203 tests, observed thirty minutes and longer. Comparison of examined spaas with Hot Springs, Ark., and most of renowned European springs favorable in; some instances higher figures detected in Hot Springs, Va., than Kissingen, Nauheim, Kreuznach, Carlsbad, Baden Baden, even than Gasthein. Only three European spas are stronger than Hot Springs, Ark., and Hot Springs, Va., so Magnesia Spring, Va. 280 M-U. (1000 cc.) Swimming pool, Warm Springs, equals 13 milligr. Rad. salt, several millions M-U. Bathhouse swimming pool Hot Springs equivalent to 203 milligram Rad. salt. Remarkable results of treatment attested by physicians by this method could be so explained. Overdose of radioactive spring treatment harmful (therapeutic indi and contraindications. See Zueblin's Monograph, Md. Medic. J., 1914. LVII, 5-6) medical, individual supervision absolutely necessary.

Functional Changes in Experimental Hydronephrosis. By N. M. Keith and R. R. Snowden, Baltimore, Md., April 2, 1915. Archives of Internal Medicine, February, 1915.

Hydronephrosis was produced in dogs by a slender rubber band about the ureter 3 cm from its entrance into the bladder. This was found sufficient to produce a partial ureteral obstruction, resulting in the development of an intraureteral pressure of 20-30 cm of water. In every case so treated a true hydronephrosis developed, with dilated, torturous ureter, dilated kidney pelvis, and dilated renal tubules. All such kidneys were, in time, enlarged and oedematous and

exhibited an engorgement of the capsular veins, the latter varying from slight to very marked, but distinctly present in every case. Healthy dogs were selected, one kidney removed and the hydronephrosis produced on the opposite side. A dog from which one kidney had been removed continued to show a normal functional capacity, as far as tests employed were concerned. Hence, in the recorded experiments any functional changes observed were considered as due to the hydronephrosis. Definite functional changes were constantly found. These were: Moderate reduction in phenolsulphonephthalein excretion, slightly prolonged elimination of lactose, polyuria and an increase in the non-protein nitrogen content of the blood. There were only occasionally found faint traces of albumin in urine. There was no delay in appearance of glycosuria after injection of phloridzin, nor was there at any time any oedema. After a time (10-15 days) pyelonephritis invariably developed and death quickly occurred from severe renal insufficiency. During period when infection did not complicate the condition, the characteristic functional changes resulting from a moderate hydronephrosis seemed to be a moderate dimunition in phenolsulphonephthalein output, nonprotein nitrogen increase in blood, and polyuria.

Case of Chronic Progressive Chorea. By J. A. F. Pfeiffer, Washington, D. C., April 16, 1915. American Journal of Insanity, January, 1915.

The interesting features in this case are the early onset of the disease, the absence of homogeneous heredity, and especially the pathological findings.

The physical development of the patient was up to the normal standard, and he had never suffered with symptoms of nervousness previous to the onset of his illness; and no hereditary factors could be determined.

The pathological changes were characterized by an intense degeneration of the nerve cells and an enormous increase of neuroglia tissue in the external nucleus of the optic thalamus. The lenticulate nucleus was similarly diseased, but the degeneration appeared more diffuse. The changes in the caudate nucleus were less severe. The vessels of the diseased areas were unaltered. The internal capsule was intact, but the striothalamic fibres were reduced. Many of the fibres of the lenticular loop were degenerated and the subthalamic nucleus appeared atrophic. The fasciculus retroflexus Meynert was affected. A number of the cells of the tegmental nucleus were altered and the glia was increased.

The pyramidal system was traced from its origin in the cells of the motor area throughout its course, but presented no alterations. No pathological changes occurred in the cord.

This exhaustive anatomical research is the first demonstration of the fact that the pathological changes in chorea, responsible for the involuntary movements, consist in an affection of the neurons in the nucleus ruber, the lateral nucleus of the optic thalamus and the lenticulate nucleus, thus interfering with the conductive integrity of the cerebello-thalamo-rubro-cortical path.

Methods of Finding Early Cases of Tuberculosis. By B. L. Taliaferro, Catawba Sanatorium, Virginia. Old Dominion Journal of Medicine and Surgery, February, 1915, pp. 77-82.

The tragic result of delayed diagnosis is mentioned. Both the patient and doctor are to blame for the late diagnosis, the former in delaying too long to consult the doctor, the latter in delaying too long to make the correct diagnosis—in many cases as a result of careless, hurried work, the case being treated for indigestion, malaria, grippe, bronchial trouble, weak lungs, run-down condition, malaria and even typhoid fever. Medical schools should devote more time to this one-seventh of the mortality producing disease. The public should be educated as to the signs and symptoms of the disease. Many early cases are found by expatients and nurses and persuaded to see the doctor. Education must be continuous and should commence with the children.

Dr. Barnes suggests that we advertise and keep on advertising, in the daily paper and on billboards, in factories and in the street cars, until the public is familiar with the symptoms of this disease. How can the state spend money to greater advantage than to find the cases before they are incurable and before they have infected others?

The following advertisement is suggested:

READ THIS.

It may save **Your Life.** The object of this advertisement is to instruct people in the symptoms of tuberculosis of the lungs—consumption—so that they will go to a physician before it is too late.

The prominent symptoms are then given.

Roentgen Technique in the Treatment of the Thymus Gland in Graves' Disease. By C. A. Waters, Baltimore, Md. Bulletin of the Johns Hopkins Hospital, February, 1915.

Within recent years various organs of internal secretions have been subjected to Roentgenization in the treatment of Graves' disease.

Druing the past year over 100 goiter patients have received Roentgen treatment of the thymus in the Johns Hopkins Hospital. Different types of cases and different stages of the disease have been dealt with. The treatments were divided into three series with intervals varying from two to three weeks between irradiations; each series consisted of six irradiations given over the anterior chest wall in the first, second and third intercostal spaces along the right and left sternal margin. Each portal of entry which was 5 cm in diameter received a dose of 7½ H. at each sitting. Therefore, each portal of entry received 7½ H. three times, or a total of 22½ H., the six areas receiving a total dose of 135 H.

The nervous disturbance and general health appear from our observation to be the first to show improvement followed by a slowing of the pulse rate and finally improvement in the blood picture. The changes in the blood occur principally with an increase in the neutrophilic elements and a decrease in the small mono-nuclear lymphocytes. The exophthalmus offered the greatest resistance, but in five cases this showed very marked improvement.

The normal skin reaction after Roentgenization in a manner described consists of a definite faint blush, which appears in from one-half hour to six days after irradiation, usually lasting from one to two weeks, gradually fading away, followed by a slight pigmentation, which by the end of three weeks has also entirely disappeared.

Tuberculosis: The Home Hospital Experiment. By Donald B. Armstrong, M.D., New York, N. Y. U. S. Public Health Reports, Jan. 1, 1915.

The Home Hospital experiment was established by the Association for Improving the Condition of the Poor on March 19, 1912:

1. To prevent spread of tuberculosis from sick to well members of family, and particularly to protect children from infection.
2. To cure any of family who are in early stages of disease.
3. Improved health and larger earning capacity to patients whose cases are moderately advanced.
4. To complete the rehabilitation of the family, physically, economically and socially.

Since the beginning, of a total of thirty-six positive patients and ten suspects discharged during the two years only two cases have relapsed. In no instance has a well member of a family developed symptoms of tuberculosis, either while at the Home Hospital or since discharge. Further, the excellent results obtained with the infants and children indicate, we believe, the real value of the experiment.

Briefly, what can be said regarding the effect of the Home Hospital treatment upon the earning power of the family? Of the families discharged in the last year, their average weekly income on admission was $6.34; on discharge it had increased to $11.17.

The cost per patient is 66 cents. The average per capita cost of seventeen New York State tuberculosis institutions giving individual treatment is $1.40.

Such a work aims at causes; seeks not only the cure of the individual, but the protection of society; is concerned with the patient, his family and environment, and deals with fundamental questions of livelihood and of life.

X-Rays and Their Use in Treatment of Cancer. By John D. MacRae, Tampa, Fla. Journal of the Florida Medical Association, February, 1915, pp. 225-228.

X-rays vary in power to penetrate tissues. Tissues vary widely in sensibility to X-rays. Cells having great reproductive activity, i. e., epithelial cells, are extremely radio-sensitive. Highly specialized cells, such as nerve cells, are practically immune to therapeutic doses.

The Coolidge tube can be regulated so that its output may be varied at will or maintained at a given intensity for long periods.

Cancer cells are radio-sensitive, and success in treatment depends on this fact and on our ability to deliver right dose to pathological tissue while at same time we protect adjacent parts.

The use of radiochrometers makes possible measurement of doses.

Filters of aluminum to stop soft rays, and lead shields to limit area to be irradated, are indispensable.

Deep therapy is made practical by use of tubes which are unfluctuating in output and capable of being accurately regulated.

Superficial cancer can be treated without pain and with good cosmetic results. Deeper seated cancer should be surgically extirpated and the X-rays used to limit the possibility of metastasis or recurrence. Inoperable cases may be relieved of pain in large measure by X-radiation, and in some cases may be cured or so changed in character that surgical treatment may be successfully applied.

The History of Medical Ethics. By George Wythe Cook, Washington, D. C., April 3, 1915. New York Medical Journal, Jan. 23, 1915, pp. 141-146.

There being no associated treatise in the English language on medical ethics, the writer has sought to bring together in as succinct a manner as is compatible with fidelity a narrative of the conceptions of wise and noble men of the profession of medicine of standard of character that they should avow and maintain. While the essence and spirit of the whole matter is contained in the Hippocratic oath, it is interesting to observe how the views of great medical men of all ages harmonize in this particular. The Vedic and Unani medical oaths are similar to the Hippocratic. Until after the seventeenth century medical ethics and forensic medicine were classed together, and legal enactments governing medical practitioners contained such drastic and unmerciful penalties it is amazing that anyone had temerity to engage in the practice of medicine at all.

Medieval law for regulation of practice of medicine, promulgated by Emperor Frederick II in 1240, contained requirements of a high grade and creditable character. Lanfranc, the founder of French surgery, delineates the requisites necessary in a surgeon.

John Arderne, a distinguished English surgeon, celebrated for his treatise on fistula in ano, gives wholesome suggestions as to essential qualities desirable in a good surgeon.

Thomas Linacre, in 1518, founded the College of Physicians of London in order that its members might be "improved in learning, in practice of medicine, and in the morals of their profession."

In reviewing the whole history one must see that fine, high ideals were held in common by all great medical men.

SURGERY, GYNECOLOGY, OBSTETRICS AND GENITO-URINARY DISEASES

THE COMPLEMENT-DEVIATION TEST AS A GUIDE IN INFECTIONS OF THE URETHRA, PROSTATE AND VESICLES.*

By Thomas V. Williamson, M.D.,
Norfolk, Va.,
and
S. W. Budd, M.D.,
Richmond, Va.

The complement-deviation test is one of the newer additions to laboratory methods for diagnosis, and it bids fair to become one of the most valuable. This test is a modification of the Wassermann technique, in which an antigen or emulsion made from bacteria suspected of causing the disease is used in place of the syphilitic preparation. It can and, eventually, will be used in the diagnosis of a variety of diseases.

Last February we appeared before the Tri-State Medical Society with a paper dealing with the use of this test in genito-urinary work. Since that time we have had considerably more experience with it. To the best of our knowledge, this subject has not been presented to any Southern medical assembly before or since that time and for this reason we thought it would be of interest to you today.

The complement-deviation test was first used by Mueller and Oppenheim in 1906 in the diagnosis of arthritis. They found, by using a gonorrheal antigen, the cases which were known to be of Neisserrean origin gave a positive reaction. They also obtained a positive reaction in a number of cases in which the etiology was uncertain, although later, by thorough laboratory methods, they succeeded in isolating the gonococcus. The value of the test having been proved, Swartz and McNeill then applied it to all forms of gonorrheal infection. They first used antigen prepared from six strains of gonococci only and found it unreliable, because it did not embrace all the strains known to the bacteriologist. They rightly concluded that it was useless to use the test unless the antigen had been obtained from all the different strains. They secured far better results by using a twelve-strain antigen, as the possibility of error was thus reduced to a minimum by covering a wider field in dealing with the infecting agent; this twelve-strain antigen is the one employed today.

Much careful work has been done since 1906, and today the test is undoubtedly an extremely valuable adjunct to our clinical facilities. In the light of our present knowledge concerning this test the following facts are observed when dealing with urethral, prostatic and vesicular inflammations.

First—In the first few weeks of an acute specific urethritis the test is negative, due to the fact that toxins have not been absorbed into the general circulation in sufficient quantities to stimulate the formation of antibodies.

Second—After a specific inflammation has existed for several weeks the test is positive; this positive phase usually appearing in from three to six weeks. It is interesting to note in this connection that a positive reaction may be obtained by introducing an artificial antigen into the blood stream. For example, if we use a gonorrheal vaccine on a healthy individual, a positive reaction would occur. For this reason we should never make use of the test during, and for a considerable period after, the use of vaccines because the reading thus obtained would be misleading.

Third—The test is frequently positive in cases not clinically cured when all other labora-

*Read in Section on Surgery, Southern Medical Association, Eighth Annual Meeting, Richmond, Va., November 9-12, 1914.

tory methods have failed to detect the presence of gonococci.

Fourth—The test is generally positive for several weeks or a month after a clinical cure because the system is slow in eliminating antibodies. The period necessary for final elimination of antibodies corresponds very closely to the time needed for their development at the beginning of the disease.

Fifth—When a short time, three to six weeks, has elapsed after a clinical cure, the test is uniformly negative.

Basing our conclusions on the facts enumerated, we assume that a positive reaction, except in the narrow limits described, is indicative of focis of infection remaining in the body, and that it is sufficient ground to refrain from pronouncing a cure, to interdict intercourse or to prohibit marriage.

Granting, then, that the test is to be relied upon, we ask in an analytical frame of mind wherein lies its chief value. It is manifestly unnecessary to make routine use of it as a diagnostic aid in cases where the microscope shows gonococci. Therefore, eliminating the employment of the test in all cases except where its use is indicated for a definite purpose, we will rely upon it first—in medico-legal questions involving infections caused by the gonococcus; second, for differential diagnosis in acute or chronic arthritis; third, in those long-continued and puzzling forms of inflammation of the urethra and adnexa in which all other laboratory methods have failed to find or isolate the gonococcus.

It is extremely doubtful if the complement-deviation test will ever be used extensively in a medico-legal sense, although there are great possibilities for it. It would be very difficult to induce a guilty person to submit to an examination through fear of having the truth known.

To illustrate how well this test would serve to bear true testimony, let me cite several instances from cases on our list:

Some time ago a man who had been married three years and who had suffered with urethritis eight years ago came into the office and claimed that his wife had infected him. This man had been away from home for a number of months and gave us a history of being infected by his wife just one week before his visit to us. The complement-deviation test was positive. Therefore, remembering that it takes from three to six weeks to develop a positive condition, and since the patient was away from home at that time, it was clearly impossible for that man to have been infected by his wife. In this case we had data so definite that we later made the patient confess that he had been infected two months before while away on a business trip.

Another case will prove exactly the opposite:

A young man, having been married three weeks, came to us stating that he had had a relapse from a gonorrheal infection which he thought had been cured two years previously. He had absolutely no symptoms before marriage. This infection gave every earmark of acute primary urethritis and not that of the recurrent type. The complement-deviation test was negative, showing definitely, when we remember that it takes from three to six weeks to develop the positive phase, that this patient had been infected by his wife and that this condition was not a rcurrence of the old trouble.

Another interesting case which proves the value of the test along these lines occurred quite recently:

We had been treating a patient for some time for chronic prostatitis. He had never been a model patient and from time to time digressed from the paths of probity. We had been unable, by microscopic and cultural tests, to find gonococci in the discharges from the prostate or vesicles. However, about two weeks ago he appeared at the office one morning with the evidence of acute urethritis. He insisted that this was not a new infection but a recrudescence of the old condition. Complement-deviation test in this case was negative, showing that the infection was a new one instead of being a recurrence of the old.

It is not the purpose of this paper to touch upon the question of arthritis, but let us digress for one moment to mention an interesting fact brought out in the study of the complement-deviation test which tends to shed a new light upon the question of the inflam-

mation of the joints. It has been the general impression among the medical fraternity that a gonorrheal condition exists indefinitely and that, in a vast number of chronic urethral and prostatic cases, an acute inflammation of the synovial membranes takes place due to absorption of gonococci into the blood stream and subsequent deposition in the joints. It has been definitely proven that nearly all acute gonorrheal inflammations of the joints take place within three to six weeks after a fresh infection with gonococci and that the vague relapsing symptoms which have been so constantly noted in arthritis of the chronic type are caused by an absorption of secondary bacteria from a focus in the prostate or vesicles and that they are not due to acute gonorrheal conditions there.

In our opinion, the greatest field for the usefulness of the complement-deviation test lies in dealing with the last of the three classes of cases we have mentioned—that is, the chronic conditions of the urethra and adnexa in which the existence of the gonococci by all other laboratory means could not be demonstrated. In our experimental work with this test we have almost exclusively confined ourselves to the study of this type of cases, and we have been struck with the fact that these tests, when we could not demonstrate the presence of the gonococcus by all other laboratory means, have almost invariably proven negative.

The day has not long passed when pathology, as we now define the term, was unknown; when bacteriology was unheard of and when knowledge of inflammations of the urethra and adnexa was vague and nebulous. Surmise and theory existed in lieu of scientific certainty. Then Neisser discovered the gonococcus and synchronously the pathologist demonstrated that the posterior urethra, prostate the seminal vesicles and even the scrotal contents were invaded by direct extension and progression of this inflaming micro-organism, leaving end results in the ravaged tissues which were recognized as distinct pathological entities.

It has been thirty-four years since Neisser made his great discovery, and our knowledge concerning the diplococcus which bears his name has steadily increased since then. He taught us to stain it with the basic aniline dies. Gram showed that it decolorized by his technique; Bumm cultivated it upon blood agar and finally the complement-deviation test has been added to the quota of laboratory methods of diagnosis.

At first, any intra-cellular diplococcus which flourished on the urethral mucous membrane was called the gonococcus. The pseudo-gonococcus proved the fallacy of this belief, and as the technique of examination improved, other diplococci and so-called involution forms of plain cocci and bacilli added to the confusion. Gram's strain could not always be relied upon as a differentiating point between these bacteria, as some of them were decolorized by this method just as easily as the gonococcus. Culture, when positive, was, of course, absolute proof of the existence of the gonococcus, but it was so frequently negative, by reason of an overgrowth of other bacetria, that in the long run it was rather uncertain and undependable.

In many cases one test was enough to establish the identity of an infection as gonorrheal; in others, all tests failed to ultimately convince the clinician of the presence or absence of this exciting cause of inflammation. The difficulty of demonstration progressed directly with the course of the disease. It was easy enough to find the gonococcus in nearly all cases of acute urethritis, less easy in the sub-acute forms and frequently impossible in the chronic stage.

And so we arrive at the present day with the advent of the complement-deviation test. We find this diagnostic process uniformly positive when the gonococcus is undoubtedly the exciting factor of disease, but it, too, becomes negative with the lapse of time. And we ask, why are all these tests so uniformly positive

in acute specific urethritis? Why do they become doubtful in the declining periods? What makes them so consistently unreliable as urethral inflammation reaches the aspect of chronicity? There must be some reason for this. Error evidently lies either in the established belief that the gonococcus lives indefinitely or in the methods we use to detect its presence.

The gonococcus is almost always the only micro-organism found in acute urethritis, while quite often, as the severer symptoms fade and wane, other bacteria become associated in keeping the inflammation alive, until, finally, staphylococci, streptococci, colon bacilli, pseudo-diphtheriae, etc., seem to be the sole survivors in the nutritious urethral feeding ground. In this contingency, the gonococcus is gone, as far as all tests are able to show, and its place is taken by a vast array of secondary invaders that keep up a chronic inflammation for years and, as far as the patient himself is concerned, do untold damage by the pathological changes wrought in the genito-urinary mechanism.

Study shows that the bacterial flora of the urethra is numerous and varied. Staphylococci, streptococci, colon bacilli, pseudo-diphtheriae, micrococcus catarrhalis, micrococcus-urinae and other species flourish there normally, but, under ordinary resistance of the host, they are harmless. In other words, although they live in the urethra, they do not primarily infect its mucous membrane. Some avenue of entrance must be created for them before they can act. The gonococcus enters the canal, spreads by direct continuity throughout the anterior, and, in about 90 per cent of all cases, travels into the posterior urethra, quite frequently involving the adnexa. It leaves the mucous membrane denuded and excoriated behind it. A secondary infection then takes place through this injured membrane by the normal inhabitants of the urethra. To be bacteriologically exact, these secondary invaders are not necessarily inhabitants of the urethra. They may come and, in many cases, do come from the rectum, large intestines, bladder or kidney. In the end—probably after many months of conflict—these secondary hordes, being more virulent and aggressive, are left in sole possession of the field. It would seem, therefore, that in a great number of cases a primary gonorrheal urethritis is followed or supplanted by a secondary infection of one or more other micro-organisms.

It is in these cases of secondary infections, then, that the complement-deviation test is of greatest value to the diagnostician.

We are constantly requested by patients to state if they still harbor gonococci in the urethra or in the glands which empty into it. Unfortunately, our knowledge along this line has not reached the stage of perfection where we are enabled to definitely answer these questions, and our resourcefulness is often taxed to its utmost capacity in dealing with those who naturally and rightfully desire this information. Any test which is as accurate as the complement-deviation test must necessarily be of the greatest service to us and we believe that as each year goes by and as we become more familiar with its technique, we will rely upon it more and more and that finally, by its use, we will be able to answer such questions more clearly, definitely and safely.

ABDOMINAL ANOMALIES—REPORT OF FOUR UNUSUAL CASES.*

By F. G. DuBose, M.D., F.A.C.S.,
Selma, Ala.

Freaks of nature are curious, interesting and less often instructive. In presenting these cases my only purpose is to impress on the memory that we are confronted rarely with very unusual conditions and that we should not less frequently recognize the anomalous in diagnosis.

Case 1. Coexisting intrauterine and extra-

*Read in Section on Surgery, Eighth Annual Meeting, Southern Medical Association, Richmond, Va., Nov. 9-12, 1914.

uterine pregnancy at term; living infants. Lucy Green, colored, age, 35; has had seven children, six of whom are living. Married twice; four boys by first husband, three girls by second husband. No miscarriages. Last labor Jan. 10, 1913. Midwife in attendance; child born at 12 noon. Recog-

Case 1, Fig. 1. Extra and Intra Uterine Pregnancy twins—Ectopic to Nurse's Left.

Case 1, Fig. 1. Mother and Twins.

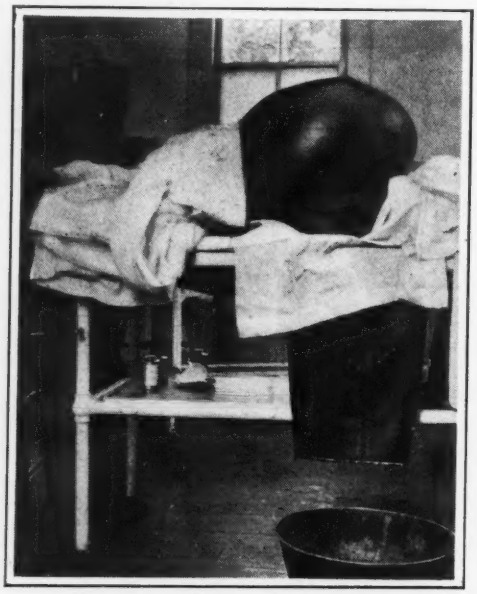
Case 1. Twins at 22 Months—Ectopic by the Dog.

nizing the presence of twins and after futile efforts to effect the delivery of the second child the midwife sent for Dr. R. P. Chisolm, Summerfield, Ala., who arrived at 6 o'clock that afternoon. After examining the woman, Dr. Chisolm made a diagnosis of abdominal pregnancy with viable foetus. He placed the woman in a wagon on a bed and brought her six miles through the country to Selma, Ala., arriving at the Burwell Infirmary at 11 p. m. Here the patient was placed under the care of Dr. W. W. Harper, who concurred in the diagnosis, and by whose courtesy I am permitted to report this case. Jan. 11, 1913, at 10 a. m., under ether anaesthesia administered by Dr. Jas. Keenan, an abdominal section was done by Dr. Harper, assisted by Dr. DuBose, and the second baby removed from a large right ovarian amniotic sac. The cord was immediately clamped and cut and the child cried after a few minutes of artificial respiration and was handed to the nurse. The weight of this infant was two ounces more than its sister, born naturally the previous day. The pedicle arose from the top and upper posterior surface of the right broad ligament was ligated and a few omental adhesions to the gestation sac were tied off and the sac removed. The abdominal incisions closed with catgut reinforced by interrupted silkworm gut sutures. Not exceeding four ounces of blood was lost during the operation. The mother convalesced uneventfully, and she and the two babies are now well, twenty-two months after this record-breaking occurrence. On searching literature we have been unable to find a parallel case, that is, where all survived as a result of obstetric delivery and abdominal section. There were present at this operation Drs. Chisolm, Summerfield, Ala., and Harper, Keenan and DuBose, Selma, Ala. Photographs at birth and at the age of 22 months.

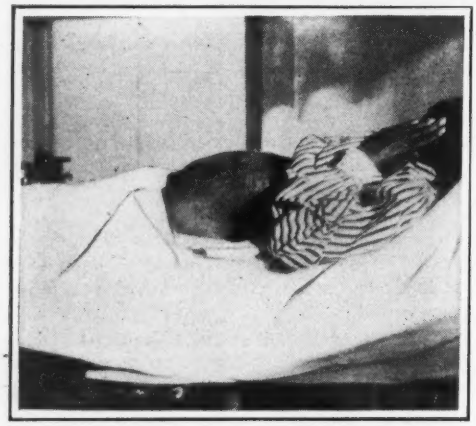
Case 2. Misplacement of both kidneys, lying below brim of pelvis. H. B. K., male; age, 36; tailor; family history negative; married; father of three children; thin, angular, but always in good health previous to the occurrence of rigors, fever, sweats and nausea, beginning in April, 1914. Seen first in consultation with Dr. Rogan during this attack. Daily range of temperature, 101 to 104 Fh. Tertian malarial parasites found in blood; also high leucocyte count. Temperature not controlled by quinine. Urine acid reaction, quantities of pus and renal epithelium; no casts. Palpable tumor found in left pelvis, lying just below brim. Rectal examination negative. Nature of tumor undetermined. Diagnosis pyelitis complicated by malaria. Improved under treatment, but had recurring attacks of pyelitis. Seen again in consultation in October, 1914. Mild pyelitis still present, pelvic tumor palpable on both sides, extending across pelvis just below promontory of sacrum. Exploratory laparotomy advised and done on Oct. 15, 1914, to determine nature of tumor and its relationship with the pyelitis. The tumor mass was retroperitoneal and on exposure proved to be

two misplaced kidneys. Inspection of abdominal viscera revealed no other abnormality. The appendix was removed on account of periappendiceal adhesions. The incision closed. His convalescence has been slow, but with the continuance of medical treatment for the pyelitis a permanent recovery is expected.

Case 3. A 64-pound ovarian cyst. M. K., colored; female; age, 47. Nullipara. Abdomen gradually enlarging. Menopause at 40. First seen January, 1906. Diagnosis, ovarian cyst. Photograph shows degree of abdominal distension at that time. Four years before she had an attempt at removal, and the operation was concluded after incising the cyst and evacuating its contents. The wound healed after several months and the distension was progressive up to the time she came to me for operative relief. The operation was exceedingly difficult on account of extensive adhesions. An elliptic incision removed from the abdominal wall all of both recti muscles together with the overlying fat and skin, for the tumor was densely adherent throughout the parietal peritonem underlying this area. Such was the redundency of the anterior abdominal wall that the extensive resection not only was not missed but added to the cosmetic effect. The cyst was tapped and removed with uterus and adnexa. The sac and its contents weighed sixty-four pounds. The patient made an uneventful recovery and is now employed as a cook in an adjacent town. The other photograph of this case shows how she appeared after recovery.



Case 3, Fig. 1. 64-pound Ovarian Cyst—Before Operation.



Case 3, Fig. 2, After removing 64-pound ovarian cyst.

Case 4. Loose body in peritoneal cavity. Mrs. R. S., married; age, 24; nullipara; family history negative. Personal history: Dysmenorrhoea since its beginning; in bed during first year of married life with inflammation of womb, severe right-sided pain; after several months recovered, but was a nervous wreck. Constipated, digestion poor, indeterminate stomach discomforts. Recurring right-sided pain and right iliac tenderness; deep pressure over McBurney's point painful. Pelvic examination showed enlarged left ovary, uterus movable and in good position. Advised left ovariotomy and removal of appendix. March, 1914, the abdomen was opened and the examining finger found a loose body, an oval, flattened disc one-half inch thick, three-fourths inch wide and one and one-fourth inches long, with a sero-fibrinous coating, making the surfaces smooth. The interior was of degenerated tissue. The uterus was exposed and the right ovary absent and the distal half of right tube was absent. From the posterior uterine wall running across the top of the right broad ligament and adherent to its anterior surface was a narrow and strong adhesive band. In my opinion, this loop of adhesive membrane had subsequent to the attack of pelvic inflammation become wrapped around the ovary and the distal half of the tube and amputated them. The foreign body found was evidently the result. The cyst was removed from the left ovary, an ap-

pendectomy done and the abdomen closed. The catalepsy and other profoundly neurasthenic symptoms have disappeared and the patient is now in good health.

How much the movable body floating around in her abdominal or pelvic cavity had to do with the neurasthenia is a question.

DISCUSSION.

Dr. H. B. Gessner, New Orleans, La.—I would like the doctor to make one thing clearer to us. In reporting his first case he first used the expression, "ovarian pregnancy," then later said, "the ovum or fetus was in the outer part of the tube." I know some men question ovarian pregnancy, and I should like to get more information about the situation of this fetus.

Dr. F. Webb Griffith, Asheville, N. C.—I have enjoyed the paper very much and am glad to see that other people also run across snags. Two years ago, at the meeting of this association in Jacksonville, I read a paper pleading for more general use of the cystoscope in surgical work. It is very easy to look back and say what might have been done, but I believe that had this case been cystoscoped the diagnosis would probably have been made. One very useful test is the artificial reproduction of the pain of which the patient complains. This is done by using a renal catheter sufficiently large to fill the ureter and then injecting salt solution until the kidney pelvis is distended and thus causing pain. If this pain is the same as that the patient has previously had, the kidney is probably at fault. At the same time, if you note the amount of fluid necessary to reproduce the pain you have the measurement of the kidney pelvis, providing, of course, there is no reflex around the catheter. As I happened to be for a number of years assistant to Dr. Kelly, I naturally use the open-air cystoscope and heartily recommend it as a simple and most useful instrument.

Dr. Wm. Kohlmann, New Orleans, La.—I had occasion recently to look over the literature and found no mention of such an interesting case of extra and intrauterine pregnancy.

The case he reports about a pelvic kidney is rather interesting to me, especially regarding the diagnosis of such cases. With the help of cystoscope and X-ray I believe that we will be able to recognize such conditions more frequently in the future.

Such a case was reported from Mayo's clinic recently, where the diagnosis was made. I have seen two cases of this kind. The first case, which I saw in consultation, presented the symptoms of an acute surgical abdomen, most probably acute appendicitis, which proved to be a displaced hydronephrotic kidney.

The other case was a woman 25 years of age, who had been sick for some time, but on admission to the hospital her condition demanded early interference. On examination the patient showed absence of vagina and uterus, and by rectal examination a large pelvic, very sensitive mass could be felt. Such abnormal position of the kidney is often complicated with abnormalities of the genital organs.

Dr. DuBose closes—Replying to the question why I made the diagnosis of ovarian pregnancy, which is rare, rather than tubal pregnancy, which is the usual type of abdominal pregnancy. This was confessedly an opinion, and I am not certain which of the types we had in this case. The only reason I believed it to be an ovarian pregnancy was on account of the absence of the right ovary and the appearance of the gestation sac, the pedicle of which arose from the upper edge of the right broad ligament, including the end of the Fallopian tube and the entire vascular supply. The large amniotic sac looked very much like an ovarian cyst. The absence of adhesions greatly facilitated the simplicity of the operative removal. The omentum only was adhered to the sac wall.

Answering the criticism of the failure of the preoperative diagnosis in the kidney case and why the X-ray and injections of the pelvis of the kidney was not done and why the ureters were not catheterized as diagnostic measures. First and foremost this man had a severe pyelitis when first seen, and this, though improved, was still present at the time the operation was performed. It is, I believe, admittedly unsafe to use the ureteral catheter in the presence of an acute pyelitis, and in this instance the injection of collargol or argyrol into the pelvis of the kidney for the purpose of obtaining a radiogram would have been unwise. The danger of renal colic, of spreading the infection into the substance of the kidney, and of suppression of the urine after such diagnostic efforts is well known. With a pelvic tumor, recurring pyelitis of more than a year's duration, we did the exploratory section at a time when we felt the operative risk was good; the financial consideration with the patient also entered into the equation.

We employ the X-ray in the diagnosis of kidney stone and in other kidney conditions such as tumor, etc., preferring the radio-graphic uretral catheter or one with a stylet to the injections of the pelvis of the kidney, as above mentioned. One should depend, primarily, on the clinical history and the physical examination of the patient for making a diagnosis and use the laboratory and X-ray finding to confirm, alter or disprove it. One should always use all the means at hand in arriving at a diagnosis, never jumping at conclusions and doing exploratory incisions only when every other diagnostic measure has been exhausted.

It has been asked if this man had any sexual abnormality. He has none and is the father of several healthy children. His family history is good.

No, Selma is not an anomalous town, nor do freaks grow frequently down there, but we recognize them when we see them.

CASES ILLUSTRATING ORTHOPEDIC TREATMENT OF SOME OF THE DISABILITIES RESULTING FROM INFANTILE PARALYSIS.*

By Michael Hoke, M.D., and Fred G. Hodgson, M.D.,
Atlanta, Ga.

The time allowed for papers is hardly adequate to permit one to thoroughly go into the details of one case, so numerous are the mechano-anatomical facts in any given case and the procedures adopted in the treatment based upon these facts. While the minds of the orthopedic surgeons in the country have been acutely occupied in studying methods and improving old methods to put these lame children on their feet, they have not been so diligent in presenting the results of their work before general surgeons and general practitioners. I am, therefore, presenting to the section just a few cases average in type, since it is better to see a few things than to hear about a multitude.

Everything in life is relative in value. So are the end results in the treatment of the paralytic. We are confronted with lameness and deformity. The general statement holds true that with the exception of paralytic scoliosis one can entirely correct the deformities and greatly decrease the lameness by surgical procedures of orthopedic nature. That the end result is different in each individual case is true, because in each case the paralysis is different in degree in the groups of muscles involved.

Several simple guides are necessary.

1st. The plan of campaign should look forward to the minimum use of, or preferably the entire removal of apparatus.

2nd. To accomplish this operations should be done upon the skeleton which will enable the skeleton to take the weight load in a way to remove the tendency to relapse after the deformities have been corrected.

3rd. Tendon transplantation and the insertion of silk stays after the method of Lange are of value. However, no tendon transplantation or insertion of silk or other operations upon the soft tissues will hold unless the skeleton be properly balanced.

For example, in paralytic deformities of the feet no tendon transplantation or other work upon the soft structures would hold the correction, unless the skeleton of the foot be corrected at the same time, and this statement in a general way applies to the knee joint and the hip joint.

4th. Accurate skeleton balancing operations remove the necessity of the use of braces in most cases. However, braces have their periods of usefulness. With a skeleton properly corrected and the work upon the tendons and ligaments and fortifying the joints with silk stays having been done at the same time or afterwards, what muscle is left has a chance to work with the weight falling along the normal axial lines. The muscles that are left have a chance for maximum development from use.

5th. Without prolonged post-operative massage and muscle training in the hands of some one skilled in corrective gymnastics, the operations are largely useless; but if these combinations are worked, each one thoroughly, then results are always gratifying, bearing in mind always the relative value of things. In time from use of the limbs something happens which it is difficult to explain. What seemed to be the faintest muscle power becomes much stronger, very useful in locomotion, and muscle power returns oftentimes where one had not the slightest notion that there was any muscle life after the most careful examination.

DISCUSSION.

Dr. R. Tunstall Taylor, Baltimore: I have been very much interested and impressed by Dr. Hoke's excellent and valuable paper in regard to skeletal remodeling for paralytic foot deformity, but I do

*Read in Section on Surgery, Southern Medical Association, Eighth Annual Meeting, Richmond, Va., Nov. 9-12, 1914.

not believe it is necessary except in the severer cases of distortion. However, in those presenting a definite bony chock of a marked degree to operative correction after either tendon and muscle transplantation or division of the soft parts, I think we can gain more rapid progress, as he suggests, by an osteotomy or excision of parts of the dorsal bones, rather than wait for a physiological bone transformation to meet new static requirements according to Wolff's law by fixative dressings or braces.

It may be of interest in this connection to give briefly my procedure for paralytic deformities of the lower extremities during the past five years (American Journal of Surgery, November, 1911), which has proved very satisfactory in several hundred cases. I call it the "Foot Incision Method," and its aim is to have the transplanted muscle or muscles pull in a straight line, to be mechanically more efficient, from its origin to its new insertion.

If we consider the foot theoretically as having three tendons (the peronei) inserted on the outer side and three (the tibialis anticus, porticus and extensor longus hallucis) on the inner side and one inserted in the heel, any paralysis of one of these groups will cause the unopposed overaction of the other two intensified by weight bearing. Thus paralysis of the peronei results in equius varus, etc.

By transplantation of one or more of the efficient members of an over-active group to the paralyzed side of the foot we expect a restoration of the normal balance and in many instances a restoration of a useful amount of function.

Thus, for example, in a case of talipes equius varus, after division by tenotomy of the tendo Achilles, my first incision is made at the insertion of the tibialis anticus, a control suture is put in it, and the tendon is divided. Second, I make an incision over this muscle at the shin, where it is becoming tendinous, and pull the freed tendon out of its sheath. Third, at the ankle on the outer anterior aspect I make another vertical incision over the annular ligament and with a mosquito forceps make a new thecal compartment under it to allow the passage of the freed tendon, which is now brought through the adipose tissue to the annular ligament with hysterectomy forceps. The mosquito forceps is then used to pull it under the annular ligament. Fourth, an incision is then made over the insertion of the peroneus brevis and a small section of bone is removed, at which point the tendon, which has been brought down through the adipose tissues from the annular ligaments, is tightly sutured with fine silk, so that all slack in the tendon is taken up and the foot is held in eversion and over corrected. If such bony deformity exists as to prevent over-correction, the method suggested of skeletal remodeling by Dr. Hoke can advantageously be employed.

In talipes valgus paralyticus the reverse procedure is done, using the peroneus longus tendon preferably, etc. It is essential by this method to pass the tendon through the fatty tissues towards its new insertion for nutritive reasons, for the tendon has been withdrawn from its sheath and we wish also to avoid adhesions which would limit new function by traumatizing the periosteum over which the tendon now passes. A plaster of Paris cast is worn after the operation for four months, during the latter two of which only is the patient allowed to bear weight on the cast and a suitable covering sandal.

At the expiration of this period the patient wears a suitably built-up shoe to prevent a recontracture of the soft parts or a recurrence of the deformity for many reasons.

Dr. Hoke closes: The moving picture is the test of the stability of the work, and since we have been using the moving picture it shows our failures as well as our successes. (Pictures continued.)

This was a paralytic valvus. No moving picture was taken of him, unfortunately, beforehand, but I want to show his end result. (Applause.) There he is walking, and, by the way, that is only two and a half months after he was taken out of plaster. To my mind, the main thing about this work is the skeleton balance. I notice that thing does not work. It has been reported before orthopedic societies for numbers of years.

This (picture) was a paralytic equinus, but those cases are not brought before the association to show the end results. Do they or do they not relapse if you do not balance the skeleton? In my own work I was never satisfied until I began, in 1909, to develop the skeleton balance.

Now, that (picture) is not a perfect end result, but in the paralyzed child, if you can get the foot even that straight and let it alone thereafter and let it walk and develop the muscles, a year or two later that child will be very greatly improved.

This is the woman 34 years old that you saw the slides of. She is lame, of course. Her pelvis is tilted and her thigh muscles are badly damaged. She has very little muscles in the calf, yet she walks quite well without any braces or crutches.

Here is a paralytic club foot. Now, the whole work on this woman occupied but about three months, and one operation was done upon the skeleton, put up in plaster for a month. At the end of that month the second operation was done; she was in plaster for a month, was then given a little massage and muscle training, then turned loose, and this is one year after having been turned loose. You see, she has pretty good poise.

This child was operated on last January. This next picture is the same child. The light was bad the day she came in. You can see the difference in the size of the legs, though she has a very good gait.

Now, this was a child both of whose legs were entirely paralyzed. He came in about six months after paralysis, and you see there the effort to walk after one year of massage and muscle training.

As I stated, something seems to happen to those children if you get their muscles pretty well balanced and massage and exercise them. It really looks as if this was the best she could do with braces at the end of that time. It looks as if new nerve tracts developed. The muscles improve where there is very little power, and in two or three years afterwards you have muscles where you have no idea there would be any muscles.

Of course, she is frightfully lame, from a normal viewpoint, but from a total paralysis being able to get around that good is something.

Dr. John Dunlap, Washington, D. C.: I think the most important part of the work is the muscle training afterwards. A great many of these cases have been done by surgeons who, when the operation was completed, thought the work was done. The work is only started when you have completed your operation. You have got to develop those muscles, otherwise the condition is going to recur.

HARE-LIP SURGERY—ESSENTIALS IN THE PRODUCTION OF SCARLESS INCISIONS.

By Herbert P. Cole, M.D., F.A.C.S.,
Mobile, Ala.

These remarks are confined to the apparently insignificant details usually slighted by the master writers upon the subject of hare-lip and cleft palate surgery. These writers naturally stress the necessity of considering the ultimate results of speech detail and control of bony growths. It seems that within recent years these details have been emphasized at the expense of skin plastic results.

An unsightly lip scar is frequently glaring evidence of the neglect of minor details in successfully obtaining correction of speech defects. It is not the purpose of this paper to do otherwise than emphasize all that has been written by the masters relative to the essentials of lip formation, correction of nostril defect and the like. These details are replete in the literature and have no place in this discussion.

In presenting our method of attempting the scarless incision we present no claim of originality other than systematizing the details of various operators, and trust we may stimulate a renewed attention to the prevention of unsightly scars in otherwise successful corrections of labial defects. We have drawn extensively on the writings of Dr. G. V. I. Brown, of Milwaukee.

PREPARATORY TREATMENT.

Most cases may well be prepared for post-operative treatment by education in feeding from the spoon or medicine dropper for several days, and in this manner eliminating post-operative action of the lip and palate muscles. Older children should be taught to cleanse the mouth frequently with mild antiseptic solutions for several days before operation.

Adhesive plaster strips may be applied for several days to coapt the cleft edges, in this manner largely eliminating post-operative tension upon the suture line. The child accommodates itself to a diminished respiratory inlet and becomes accustomed to the presence of the post-operative tension dressings.

INCISIONS.

The numerous incisions devised suggest the choice of an incision suitable to the peculiarities of the individual case. Wherever possible such incisions should be hidden in the floor of the nostril and should not involve a paring of the mucous membrane. Cases involving the mucous membrane require the careful paring at the exact junction between the mucous membrane and skin with no sacrifice of mucous membrane or skin tissue until the completion of the final sutures. Incisions in the red mucous border of the lip should be made at an acute angle to the white skin line and, if possible, end in a teat-like projection at the center of the lip. A double line in the red border can be evolved with a little ingenuity in cases of double hare-lip.

Paring of the cleft must prepare buccal surfaces of greater area than those on the skin surface. Care in these details obviate the thinning of the lip along the suture line. Conservation of a pared tissue over the cleft edges obviates the production of an unsightly notch upon the corrected labial border. Paring is best performed by a razor-blade instrument supplemented by the angular manicure scissors.

RELAXATION.

Successful repair of labial defects rests largely upon complete relaxation of tissues. Curved scissors and a blunt dissector loosen

No. 1. Case 1010—Infant, age 3 months. Referred by Dr. Sellers, of Local, Ala. Hare-lip and anterior cleft palate. Typical flaring nostril and deviation of nasal septum.

Case 1010—Five days after operation. The last superficial suture removed on fifth day. Note the angular labial scar with normal labial and mucous membrane contours. Flaring nostril and septum defect partially corrected. This scar represents the usual acceptable results; whereas this is an angular scar and a slight one. Please compare with the results of the twenty-four hour suture method in the following case.

the tissues at the junction of the mucous membrane and alveolar process on either side. Passing close to the maxilla the dissection extends well out on either cheek beside the alae nasi. The triangular cartilage is separated at the base to prepare the flattened nostril for correction. If a nasal notch be present the mucous membrane of the notch is freshened and one or two horse-hair sutures approximate the edges to form the floor of the nostril. Considerable ingenuity is occasionally required in the production of this nostril, but the end results justify infinite care in its correction. The deviated nasal septum is next freed at its base.

At this point one may place a metal tension plate within the normal nostril and deflect the loosened septum to the midline by a silver wire suture extending from this plate underneath the affected nostril to a tension plate upon the cheek of the affected side. This method, described by Brown, of Milwaukee, may be found in the general literature.

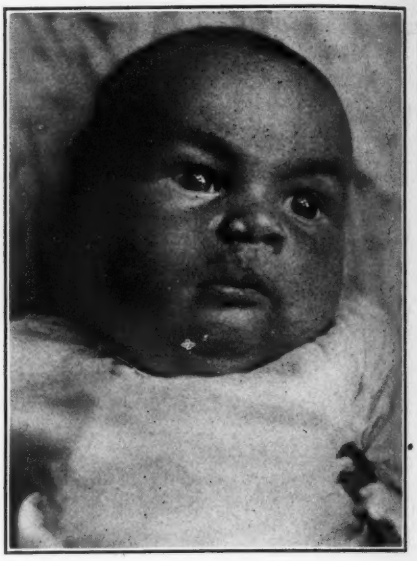
Incisions extending over the lip surface should be placed in the philtrum if possible. Otherwise angular incisions prevent a less obvious hare-lip scar, a scar more likely considered of accidental origin.

SUTURE MATERIAL.

Extensive experimentation has evolved fine horse-hair as a most satisfactory suture for the skin and outer surfaces. Its elasticity obviates the transverse scars resulting from the use of more rigid material and there is a lessened tendency to the extension of infection along these sutures.

After placing the temporary coaptation suture on the skin surface the lip is everted and one or two coarse tension sutures of horse-hair are deeply placed in the buccal side, but do not involve the skin. A few interrupted fine catgut sutures close the incision on the buccal border, preventing infection from the mouth. A rather broad-bladed fine tooth for-

No. 3. Case 1047—Referred by Dr. Webb, of Calvert, Ala. Infant six weeks old. Hare-lip, flaring nostril, deviated nasal septum.



No. 4. Case 1047—Five days after operation. All skin superficial sutures removed in 24 hours. Note complete absence of scar. The incision lies in the philtrum. Normal labial and mucous membrane contours. Correction of flaring nostril and deviated septum by Brown's silver wire and double plate tension suture.

cept is essential during this portion of the operation.

The temporary tension suture upon the skin is now removed and the skin edges are carefully approximated by fine horse-hair sutures placed at frequent intervals close to the incision borders. These are best inserted with a No. 1 curved Lane cleft palate needle, using a fine pointed non-locking needle holder, such as the Crile instrument.

The final sutures to be placed are those approximating the red border of the lip. Only two or three such sutures are necessary. A redundance of tissue forming a teat-like projection of the red border is always preferable.

The sutures on the skin surface are removed within twenty-four hours. Those in the nostril and red border of the lip may remain forty-eight hours or longer, but are better removed within forty-eight hours. All tension on the suture line is prevented by an adhesive plaster strip from cheek to cheek over a cotton collodion dressing. An additional strip may be passed from cheek to cheek about the chin and a third tension strip across the nose.

The tension horse-hair sutures on the buccal surface may be removed by the fourth or fifth day. The plaster tension strips are well worn for a week or ten days. Weak iodine before, during and after the operation prevents active infection. Mild antiseptic mouth washes in older children, and cleansing swabs in infants are of value.

We present the photographs of two cases, one illustrating the results usually acceptable from the standpoint of scar formation, second case illustrating the scarless effect of the twenty-four-hour suture method.

Van Antwerp Building.

X-RAY STUDIES OF THE APPENDIX.

By J. W. Squires, M.D.,
Roentgenologist to the Charlotte Sanatorium, Charlotte, N. C.

X-Ray studies of the ileocaecal region have proven an important factor in determining the pathology of this portion of the intestine. Case[1] in his studies has called attention to the not infrequent occurrence of incompetency of the ileocaecal valve, and a method of diagnosing same. The presence or absence of ileocaecal adhesions, the demonstration of the bismuth filled appendix, and the reflex disturbances of the stomach produced by these factors have been checked up with the operative findings with favorable results.[2]

The writer in this paper desires to limit himself to the discussion of the appendix from a Roentgenographic and Roentgenoscopic standpoint. The Roentgenogram is considered only half of the examination, as the presence and extent of adhesions cannot be determined with any degree of accuracy without the use of the Roentgenoscope.

The facts to be determined from the Roentgen-ray investigation of the appendix are first, if the appendix is of the patulous type; if so, whether functionating or non-functionating. Second, the presence or absence of adhesions, and if adhesions are present whether they are sufficient to produce symptoms. In some cases adhesions may be demonstrated associated with a normal motility of this portion of the intestine, but the patient complains of a discomfort in the right side. In such cases, if adhesions are found and are associated with the above symptoms they should be considered an important diagnostic point.

Another question to be determined is what technique should be employed in the study of the appendix? First, the writer considers the nature of the test meal employed very important. Second, the thoroughness with which the examination is conducted by means of a number of Roentgenograms and by the use of the Roentgenoscope. As to the habits of the patient the writer does not believe in interfering with these. If he is accustomed to taking a laxative every night this is permitted. No special preparation of the patient is made for the examination. The regular breakfast is omitted and the test meal substituted for this.

The technique of the examination may be summarized as follows: The patient is given a meal of 70 grams of bismuth subcarbonate in 400 C. C. of buttermilk. Four hours later the first Roentgenogram is made at which time the meal will be observed passing through the terminal ileum, and possibly in the caecum for a short distance. From this time a Roent-

Fig. 1. Functionating Appendix.

The gastric symptoms were so marked in this case that the patient first consulted a stomach specialist. The X-Ray findings of the stomach were marked pylorospasm, negative for ulcer. Ileocaecal region, slight stasis in ileum and patulous appendix with no stasis. Operation—Appendectomy. Symptoms relieved.

[*] Read in Section on Surgery, Southern Medical Association Meeting, Richmond, Va., November 9-12, 1914.

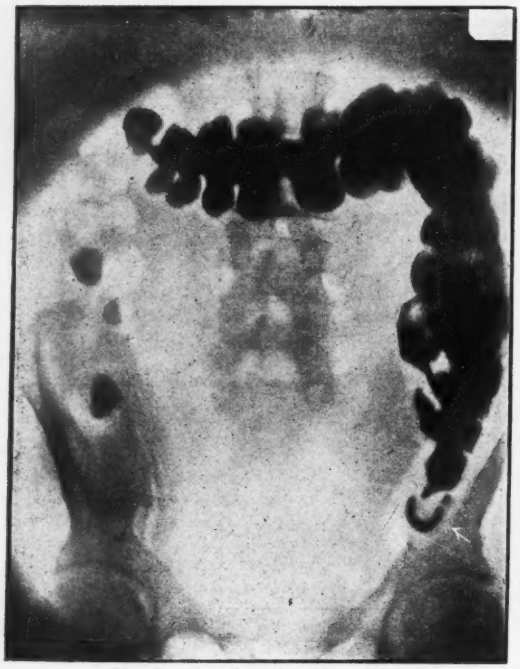


Fig. 2. Non-functionating Appendix.
The clinical symptoms in this case were referable to both the stomach and the appendix. The X-Ray finding of the stomach were hyper-peristalsis and a spastic filling defect of the duodenal cap. Ileo-caecal region, patulous appendix with stasis. Operation—Appendectomy. Symptoms relieved.

Fig. 3. Chronic Appendicitis, with Adhesions.
The diagnosis in this case was not based on the demonstration of a patulous appendix, but rather on the fact that the tanrsverse colon was bound to the caecum by a mass of adhesions. Operation—Appendectomy. Symptoms relieved.

genogram is taken every hour until six are taken. This method enables the operator to study the motility of the caecum and terminal ileum very closely, and at the same time he is given a good opportunity to detect the bismuth filled appendix. This procedure of taking consecutive Roentgenograms is important as often it is difficult to locate the entire outline of the appendix. It may soon be covered by some portion of the intestine filled with bismuth, and will probably if it is the functionating type empty earlier than the bismuth of the intestine.

The Roentgenograms are taken in the prone position. At intervals during the examination Roentgenoscopic observations are made. The writer considers this a necessary procedure in the formation of a correct diagnosis. The value of the Roentgenoscopic examination is due to the fact that the intestine can be observed from different angles, the patient can be turned in any position desired, and different views of the intestine obtained while being palpated. If adhesions are present, the intestine can be moved from one position to another, and by manipulating the abdomen, the extent of the adhesions can be determined. Also the appendix being frequently covered by some portion of the colon filled with bismuth is more readily detected by the Roentgenoscope. After it is located by this method a Roentgenogram may be taken.

In the study of acute appendicitis the X-Ray is seldom employed. The writer has examined only one case of this type. In this one the appendix was found filled with bismuth, and had not emptied in three days. The patient was operated upon on the fourth day after the bismuth meal, and a gangrenous appendix filled with bismuth was found.

It has been suggested by some of my colleagues that probably the presence of bismuth in an appendix would excite an acute attack where a chronic inflammation already existed. In my experience I have discovered no aggravation of symptoms from the bismuth in the appendix.

The study of chronic appendicitis constitutes a more useful field for the X-Ray. If the appendix shadow is detected a number of facts can be obtained. It can be determined whether there exists a stasis in the appendix, kinks or adhesions. If the lumen of the appendix has been obliterated then we are forced to form our conclusions from the adhesions and the degree of stasis present in the calcum sileum.

First, we will discuss the detection of the patulous appendix and its significance. Until a few years ago the Roentgen-ray detection of a patulous appendix by means of an opaque meal was considered an accident. This was due partly to the nature of the opaque meal employed and to the fact that close observation of the ileocaecal region was not systematically made. Early investigators employed opaque meals, consisting of bismuth subcarbonate mixed with cereals. This bismuth being mixed with solid material rendered the appendix less likely to be filled. A preparation consisting of an opaque substance suspended in buttermilk or some of the various artificial milks gives a liquid meal and one more suitable for a study of the appendix. With such a medium radiographic detection of the appendix is possible in a larger number of cases.

Considerable discussion[3] has been elicited as to how much stress should be laid on a patulous or leaking appendix—that is, an appendix which receives material from the large intestine. Often this material is discharged by the peristalsis of the appendix, but frequently it is not discharged, being retained for varying lengths of time. It is generally conceded that an appendix which is unable to functionate or discharge should be regarded as dangerous. However, the danger of one that is able to functionate or discharge is not agreed upon. Case[4] in the discussion of this subject states that he does not assert that every appendix which permits the entry of bismuth is in need of surgical attention; that there are many cases in which surgery is distinctly not indicated, for instance, when the contents of the appendix have disappeared by the time the colon is emptied.

In the writer's experience he has found the reverse to be true. The functionating patulous appendix has been found invariably associated with symptoms in the right quadrant of the abdomen. In some cases the symptoms were reflex, being more referable to the stomach, duodenum or some other portion of the abdomen. The removal of the appendix was followed by relief of symptoms. The cases that have been operated on seem to support the theory that a functionating patulous appendix is capable of producing symptoms, and should be removed. The writer's cases are too few, however, to form a statistical opinion. He has now under observation several cases in which a patulous appendix has been demonstrated that has not been removed. The symptoms are mild, and are those that are usually termed chronic indigestion. So far medical treatment has failed to produce permanent improvement.

In the examination of these cases it was observed that the patulous appendix was very often associated with adhesions of the terminal ileum, simple ptosis of the transverse colon, or adhesions of this part to the ascending colon or caecum, and chronic constipation was nearly always found. In some individuals the appendix was found freely movable; in others, tied down by adhesions.

The appendix may be retrocaecal, and by the time the caecum has emptied possibly very little bismuth will be found in the appendix. In this type it is possible that the tip, or a small portion may be seen. By careful search with a number of Roentgenograms and by Roentgenoscopic observation frequently

the entire outline can be detected. Following the technique as has been described, the writer has demonstrated a patulous appendix in 25 per cent of the intestinal cases referred to him for examination. In these cases the time required by the appendix to empty varied from four hours to seventy-two, and in some cases longer.

Second, the question of ileocaecal adhesions: Adhesions in this region producing stasis in the terminal ileum, constriction of caecum, or a pull on the transverse colon binding it down in a mass to the caecum are manifestations of previous appendicular or periappendicular inflammation. These are readily detected by the combined method of Roentgen-ray examination. This examination determines whether simple ptosis or adhesion is the factor in producing the pathology that is present.

The behavior of the stomach in Roentgenographic studies of the appendix is also to be noted. Cases in which a diseased appendix can be demonstrated by the X-ray very frequently show reflex disturbance of the stomach, and if the Roentgenographic examination should be confined to it alone it is possible a diagnosis of a duodenal ulcer would be made. In such cases the stomach frequently shows a retention of bismuth longer than six hours, and a hyperperistalsis. This condition, on investigating the ileocaecal region, is explained by the pathology of the appendix.

Conclusions:

1. A patulous appendix, functionating or non-functionating, is capable of producing symptoms.

2. The X-ray constitutes a valuable means of diagnosing lesions of the ileocaecal region.

3. As a routine procedure in the study of obscure abdominal cases Roentgenographic examination of the appendix should be adopted

[1]Case, American Quarterly of Roentgenology, November, 1912.
[2]Jordan, British Medical Journal, June 1, 1912, No. 2683. Quimby, New York Medical Journal, October 11, 1913.
[3]Groedel, Case, Quimby.
[4]Case, Journal A. M. A., Vol. LXI, No. 20.

THE TREATMENT OF ECLAMPSIA.

By Thomas J. Tuder, M.D.,
Keokee, Virginia.

By the terms eclampsia, puerperal eclampsia, and puerperal convulsions is meant, in modern medicine, an acute morbid condition, making its advent during pregnancy, labor, or the puerperal state, which is characterized by a series of tonic and clonic convulsions, affecting first the voluntary and then the involuntary muscles, accompanied by complete loss of consciousness, and ending in coma or sleep. The disease may eventuate in death or recovery (Charpentier).

The etiology and pathology, although the subject of much painstaking research in various parts of the world during recent years, have not been cleared up. The autotoxic state, which more frequently manifests itself in a severe form in the latter months of pregnancy, reacting as a rule chiefly on the kidneys, producing a fatty degeneration of the parenchyma and giving the much-discussed kidney of pregnancy, is doubtless the chief etiological factor in most cases of eclampsia. At present this autotoxic state is believed to be closely related to the ordinary toxemia of pregnancy, as manifested generally in the early months, but occasionally persisting throughout pregnancy. By some the liver is thought to be the chief organ at fault, and at autopsy of fatal cases this organ has been found to be the seat of more or less marked degenerative changes, but whether these changes were of primary or secondary origin it is impossible to say. In other instances marked degenerative changes have been noted in the kidneys and the liver found practically normal.

However, there is doubtless a cholemic type of eclampsia, in which the liver is the chief organ at fault, although in the fatal cases thought to be of this type the kidneys usually show degenerative changes also. Cerebral lesions, hyperemia, oedema, thrombosis and hemorrhages, as well as myocardial degenera-

tion and bronchopneumonia, are probably caused by the repeated convulsions or the heroic measures used in treatment.

Women suffering from Bright's disease during pregnancy may develop uremia resembling eclampsia, and if the Bright's disease had not been detected before the convulsions it would hardly be possible to be certain then that it had existed for a long time.

The best basis for treatment of eclampsia is to regard it as a toxemia, and this naturally emphasizes the importance of prophylaxis, for far more can be accomplished in this than in the curative field. We should educate the masses until they realize that the pregnant woman should keep herself under competent medical supervision during her entire pregnancy, whether she appears to have any trouble or not, and once a month during the first six months, and two or three times a month during the remainder of her pregnancy, she should send a specimen of urine to her physician, and he should examine it carefully for albumin, casts, indican, and acetone at least. He should question her carefully at regular intervals and ever be on the alert for pre-eclamptic symptoms, the first and most constant of which will usually be headache, and then that train of symptoms suggestive of some retained toxin within the system—rapid pulse, high arterial tension, anorexia, gastro-intestinal derangements, lassitude, decrease of excretions, etc. When these symptoms are noted I would urge that the blood pressure be taken frequently. Hirst found the normal blood pressure (Faught) of 100 non-pregnant healthy women to be 112, of 100 healthy pregnant women 118, and he thinks that a blood pressure below 125 can be disregarded, from 125 to 150 needs watching, and above 150 should be the signal for the commencement of active eliminative treatment, and, if still rising, probably the induction of premature labor. When eclampsia is thought to be impending, the patient should be put on an exclusive milk diet, adding fish and white meats cautiously as the symptoms improve. The room should be well ventilated and the patient encouraged to drink water freely. At the outset a full dose of calomel at bedtime followed with a saline in the morning, and then every night at bedtime a tablet composed of one grain each of calomel, powdered squill and digitalis, also following this every morning with a saline laxative, preferably Rochelle or Glaubers Salt, until the condition is markedly improved and then Basham's mixture is indicated. Warm clothing, freedom from worry, light exercise in the open as the patient improves, and encouragement from her physician will usually ward off the attack. However, if the patient grows progressively worse and convulsions seem certain to come on very soon, artificial delivery must be considered, and the method of choice will usually be manual dilatation of the os and delivery by forceps or version.

An eclamptic convulsion is a serious matter, and the general statistics indicate a maternal mortality of from 25 to 35 per cent. Prompt and vigorous treatment must begin at once with the threefold purpose of controlling the convulsions, eliminating the poisons causing them, and emptying the uterus. One or two convulsions often cause the death of the fetus, to say nothing of the dangers to the mother.

For the control of the convulsions, one of the most widely used drugs is morphine given hypodermically in doses of from 1-8 to 1-2 grain. It is an ideal agent for the control of convulsions, but many have discarded it because it was thought that it prolonged the coma and materially interfered with the elimination of the poisons causing the convulsions.

In this connection, Stroganoff, of Petrograd, who reported as far back as 1909 a series of 360 cases, in which he used his now famous prophylactic treatment of eclampsia, with a mortality of 6.6 per cent for the mothers and 21.6 for the children, sticks to morphine as an efficient remedy. "He reiterates that he knows of no disease in which therapeutic measures display more brilliant results than in eclampsia, and he urges the more general adoption of his technic. It aims to prevent the convulsions by

reducing the irritability of the nervous system, obtaining tranquil sleep by means of narcotics, and removing everything liable to induce irritation, terminating the pregnancy if necessary, and watching over the regular action of heart, lungs and kidneys, the patient in the most favorable positions, administering oxygen in abundance, and keeping the patient under the influence of morphine and chloral, with chloroform at first until the patient feels the effect of the chloral.

In moderately severe cases, first morphine, about 0.015 gm., in one hour or sooner, 2 gm. chloral; morphine again the third hour; chloral the seventh, and 1.5 gm. chloral again the thirteenth and twenty-first hour. Delivery is hastened as necessary and fluids are supplied by the rectum or mouth, from 150 to 250 c.c. four or five times a day. The aim is to prevent the convulsions, even if as much as 4 or 5 gm. chloral and .03 to .04 morphine, plus chloroform occasionally, are required in the course of five or six hours. If the convulsions keep up obstinately delivery is hastened. Vaginal Cesarean section is indicated if necessary, but he has never had occasion to resort to operative measures. He is convinced that the mortality of eclampsia can be reduced to 1 or 2 per cent, if this method of treatment is begun early and systematically carried through, in the absence of serious complications. It is applicable to eclampsia before, during, or after delivery, and experience has demonstrated that sedatives can be relied on as the mainstay in treatment. He believes that operative measurs in eclampsia, vaginal Cesarean section, decapsulation of the kidneys, nephrotomy, or combinations of these are carrying surgery to unfounded extremes." (J. A. M. A., V. 53, p. 86, abs.)

Chloroform is a most effective remedy for the control of convulsions, but when given for this a considerable quantity is frequently required, and in late chloroform poisoning areas of necrosis and degeneration have been found in the liver, similar to those produced in eclampsia. Now many prefer ether, when a general anaesthetic must be given to an eclamptic.

Veratrum viride is a standard remedy, very effective in reducing the blood pressure and slowing the pulse, and many push this drug until the pulse is reduced to 60, for with a pulse that slow convulsions practically always cease. For the expectant treatment, this is probably the best drug at our disposal, but it should be given with the most discriminating judgment, and when the blood pressure is low, chloral and sodium bromide, or morphine, should be used instead. Veratrum viride is given subcutaneously in 10 minim doses every hour, or if the blood pressure is very high and the indications very urgent, every half hour until the blood pressure is reduced and the heart action slowed up satisfactorily. The patient must be kept recumbent, and if collapse should occur or be impending, whiskey, morphine, and caffeine are the remedies.

Nitroglycerin in 1-50 grain doses may be given by the mouth; its action begins within five minutes, but lasts only fifteen or twenty, but it is prompt and effective in reducing blood pressure. However, I feel that veratrum viride is practically always to be preferred to nitroglycerin.

Chloral hydrate has for a long time been one of the trusted remedies in eclampsia. It is given per rectum in 15 to 20 grain doses, either alone or combined with twice the amount of sodium bromide, and may be repeated every two hours as needed. In addition to the marked sedative effect, the blood pressure is lowered somewhat, and this may be lowered still further with veratrum viride hypodermically administered, as there is no contraindication to its use with chloral and sodium bromide.

Ice applied to the back of the neck is a simple remedy for convulsions which should not be forgotten.

While the foregoing treatment is being carried out, it is equally as important to look to the elimination, especially through the bowels and kidneys. A drop or two of croton oil in

a little butter placed on the back of the tongue, or if the patient is not comatose a large dose of calomel, or compound jalap powder, followed by Rochelle or Glaubers salt and a soapsuds enema should get the bowels well open. Cupping over the kidneys, hot fomentations, and veratrum viride (given primarily for the convulsions) stimulate the kidneys; and during the conscious intervals encourage the free drinking of water, but never try to give a comatose patient liquids by the mouth, for it usually goes into the lungs and may produce pneumonia. Free inhalations of oxygen assist in the elimination through the lungs, and hot packs and hot air baths are widely used to produce free diaphoresis, but Zweifel and others have recently objected to sweating these patients because the concentration of the blood is thus increased. Likewise the administration of salines, either subcutaneously or by the rectum, has recently been thought to increase the viscosity of the blood, and to get the opposite effect potassium iodide has been administered.

The belief that the convulsions were caused by poisons of placental origin was long held and still has many adherents. The death of the fetus has been regarded as offering a more favorable prognosis for the mother, but Lichenstein does not believe this and gives some very convincing statistics, while Zweifel this year reported a most interesting case, in which the uterus was removed after rupture in a fourth labor. Three and a half hours after the operation this woman developed an eclamptic convulsion, the second convulsion followed a few minutes later, and a third within an hour. Three days later coma gradually subsided, but speech was lost for thirty days. Was it anemia from considerable loss of blood? Zweifel says it was eclampsia.

However, as a rule we regard the danger from eclampsia as very much less after the uterus is emptied, and the prevailing opinion now is that this should be effected as soon after the appearance of the convulsions as possible in the majority of cases. The question is, How shall it be done? The general surgeons and many leading obstetricians favor Cesarean section, either abdominal or vaginal, and the concensus of opinion is that if this is to be done the operation should be performed within six or eight hours of the onset of the first convulsion. These patients are rarely in any condition to be transported a long distance to a hospital, and the excitement and exertion incident to the moving are bad for them. Of course, if a good hospital and competent surgical skill are convenient, an anterior hysterotomy is a pretty operation and soon over and in many cases doubtless best for the patient. Dr. Barton Cooke Hirst, of Philadelphia, before the American Gynecological Society, in 1912, said: "I am strongly opposed to the unqualified advocation of the operative treatment," and Dr. J. T. Williams, of Boston, in the *Boston Medical and Surgical Journal* of March 27, 1913, gives statistics collected from the literature of eighty-five cases of abdominal Cesarean section for eclampsia, in twenty-one of which there was also a mechanical indication for the operation, but this did not affect the mortality. There were forty-one maternal deaths, mortality 48.2 per cent.

Circumstances will doubtless continue to be such that most of these patients must be delivered by means less radical than Cesarean section. Instrumental or manual dilatation of the cervix and delivery by forceps or version is usually the method of election, and that which offers the best chance for the mother, at least in the hands of most physicians. Care should be taken to secure complete dilatation before attempting delivery.

I have not mentioned venesection for the reason that considerable blood is usually lost when artificial delivery is resorted to, and there is danger of losing too much blood if we remove much by venesection before delivery. Lichenstein estimates that during the average labor 400 c.c. of blood is lost; in spontaneous delivery of eclamptics the loss is about five per cent more, and with operative delivery

about fifty-two per cent more. The amount of blood to be removed by venesection as a prophylactic measure before convulsions is about 50 c.c.; after convulsions with a high blood pressure and a plethoric patient 250 to 1,200 c.c., but extreme caution should be observed with the constant thought of the amount of blood to be lost at delivery.

Following recent thyroid therapy, in cases of evident hypothyroidism, thyroid extract has been given in doses of from two to three grains a day up to as high as thirty or forty grains in twenty-four hours, the pulse being watched closely to see that it is not made too rapid. As a thyroid stimulant, sodium iodide, two or three grains a day, is also effective, and the beneficial effects attributed to potassium iodide may have been through its stimulation of the thyroid.

The veterinarians have recently successfully treated cows, which following delivery had a condition of paresis in the hind legs, etc., thought to be related to eclampsia, with injections of sterile air into the udder, thoroughly inflating it. Sterile air inflation of the human mammae for eclampsia has had a limited trial with some success. The theory of a placental toxin as a cause of eclampsia, which when the sustaining nourishment from the mother for the child is diverted from the placenta to the breasts, appears also in the breasts, is very interesting to say the least. Colostrum has been squeezed out of the breasts, and even the entire mammae have been excised with the intention of getting rid of this poison. The veterinarians at first injected an antiseptic liquid into the udders of cows, with the idea of getting rid of an infection within, and later they found that sterile water accomplished the same purpose, and finally that sterile air was as effective as anything.

Eclampsia is a most interesting condition, but a great deal of research will doubtless be required before the last word can be said as to the etiology and pathology, and until these are understood we cannot hope for a thoroughly rational and effective treatment.

RETROPERITONEAL TUMORS.*

By C. S. Lawrence, M.D.,
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Laparotomy for the removal of an abdominal tumor is oftentimes the easiest and most spectacular operation in abdominal surgery. Again this type of operation taxes the ability of the surgeon more than any other, and is fraught with greater danger to the patient than any abdominal operation I have ever witnessed. I have reference first to the parasitic, or long pedunculated myoma of the uterus free from adhesions which lie ready to pop out of the abdominal cavity as soon as an incision is made large enough to admit of its doing so. Second, I have reference to that type of tumor which lies behind the peritoneum, that area which lies in and follows the folds of the broad ligaments, omentum and other such structures. This space is made up of loose connective tissues with an abundant lymph and blood supply.

The type of tumors found retroperitonealy. First, are those derived from the kidney, adrenals, pancreas and uterus. Second, those from cellular tissues, the lymphatics and developmental rests.

We may see at once that any type of neoplasm, benign or malignant, may develop in the retroperitoneal space. In my short paper I shall deal with retroperitoneal tumors, having their origin in the uterus. Tumors having their origin in the anterior or posterior walls, or in the fundus of the uterus, usually develop and grow, giving less subjective symptoms than those coming from other parts of the organ. Cervical tumors push their way out between the folds of the broad ligaments, or between the bladder and the uterus, giving pressure symptoms as they grow and fill the bony pelvis.

Intraligamentous tumors as they grow separate the folds of the ligaments, pushing their

*Read before the Eighth District Medical Society, Winston-Salem, N. C., Dec. 1, 1914.

way back of the peritoneum, oftentimes getting back of the sigmoid and small intestines, distorting the anatomy of the parts. Again the tumors mould to the pelvis, crowding out other organs and making trouble for the bladder and other pelvic organs; these tumors are richly supplied with blood and lymph, often containing venous sinuses and lymph vesicles; these blood sinuses are especially dangerous, as I will point out in the report of the following case.

Mrs. S., age 42; married; no children; no miscarriages; menses began at 14-4-28, no pain, flow moderate; married at age 28; health good until about two years ago, when she began to be irregular in her menstruation; flow was quite profuse, with clots, and came on every two weeks. About that time she noticed her abdomen growing larger and some irritation of the bladder. This condition continued to grow worse until April last, when she applied for relief and was referred to me for operation by Dr. J. P. Fearrington.

Examination—Rather frail, anemic woman; heart and lungs negative. Abdominal palpation revealed a tumor mass, which filled the pelvis and lower abdomen hard and smooth; on the right side in the flank a second mass could be felt, which resembled the uterus. Vaginal examination: The whole pelvic cavity was completely filled with tumor, which could not be moved. There was no fluctuation in the pelvis, nor were there any nodules, but the tumor felt to be enclosed in a soft, freely movable tissue covering; no cervix could be palpated, neither could one feel the fold of Douglas.

Urine contained slight trace of albumin, few leucocytes and epithelial cells. Sp. 1,025. No sugar.

Blood, haemoglobin 80; 4,000,000 reds; whites, 7,500; 72 per cent polys. April 28, 1914, panhysterectomy was done. Abdominal RT. The smaller mass in right flank was found to be the uterus, and the large tumor was a retroperitoneal myoma; in front the bladder extended well up on the tumor, and behind the tumor had worked its way up under the peritoneum, getting behind the sigmoid. The blood vessels were everywhere large and plentiful. A second tumor filled Douglas' pouch.

After carefully surveying the situation, it was decided to attack the tumor by first securing the large ovarian vessels on both sides, freeing the bladder as much as possible. This we did and then went from the right side across the vagina. It was with a great deal of force that the pelvic portion of the tumor was pried out. So snugly did it fit the pelvis that there was an audible inrush of air, filling the space occupied by the tumor. The uterine vessels on left side were then secured, as were other vessels from the sigmoid. With all our care, we had a great deal of hemorrhage, but we were fortunate to save the bladder and uterus from injury. The tumor weighed thirteen pounds.

The patient went through the operation well, which took one hour and a half, and made a splendid recovery until the fourteenth day, when she had pulmonary embolus, from which she recovered, and progressed nicely until 5 o'clock a. m. on the morning of the twenty-fifth day of her operation. Then she awoke and complained to the nurse of feeling badly, and died within five minutes. Another clot from the pelvis had broken loose and blocked the heart.

In Cullen's book on Myomata of the Uterus, p. 632, Fig. 374, is pictured a tumor almost identical with the specimen here presented, and he says that this class of tumor represents the most difficult the surgeon can encounter. In his case the patient almost bled to death, and the bladder was torn out in a long strip with the tumor, which was stitched back, and the patient suffered with a phlebitis in the left leg, but finally recovered.

A word on diagnosis: In all cases of tumors of the pelvis, the exact location, size and number of tumors should, if possible, be made out before operation. More especially should we know beforehand whether the tumor is intraligamentous or not. Intraligamentous tumors are held down tight by the broad and round ligament and the infundibulopelvic ligament; the tumor cannot be moved up or down like the sub-peritoneal tumors; the round ligament is in front of the tumor; the Fallopian tube passes over the dome and the ovary and its ligament lies behind the tumor. The fundus of the uterus is pushed off to one side. The sound should be used to locate the uterine cavity, and this will indicate the position of the tumor. These with the history of the case and

other symptoms common to uterine tumors will suffice to make the diagnosis.

The treatment of myomata of the uterus. I quote Southwick, in dividing them into four classes.

1. Small fibroids which cause no symptoms and grow very slowly. These are most commonly sub-peritoneal and cause no symptoms. They require treatment only when sub-mucous or in the cervix.

2. Fibroids of the cervix and intraligamentous fibroids are dangerous complications of pregnancy, may cause sudden retention of urine, and are particularly liable to malignant degeneration.

3. Large fibroids usually produce symptoms, are usually sub-peritoneal and of long duration. Degeneration changes are late, but ten per cent finally endanger the life of the patient.

4. Submucous fibroids are the most dangerous. Necrosis occurs in forty-three per cent. Bleeding is severe and persistent. They predispose to cancer of the endometrium and inflammation of the tubes and ovaries.

The relation of fibroid tumors to sterility, fertility and pregnancy depends largely on the situation of the growth. A sub-mucous fibroid often prevents pregnancy or causes abortion. If the placenta is retained above the fibroid, hysterectomy is necessary. Fibroids in general diminish fertility, but if pregnancy does occur, the patient, on account of the danger of complication, should be delivered in a hospital.

The menopause ushers in the period of malignant degeneration, although in many cases the growth of the tumor is checked. Ten per cent of the fibroids operated upon between fifty and sixty years are complicated by cancer, and sixty per cent of the degenerations occur after 40.

Larger fibroids are often associated with visceral and cardiac degenerations; about eleven per cent are dangerous to life. In a series tabulated by Crossen nineteen per cent of 1,815 cases would probably have caused a fatal termination from local complications or degeneration. In addition thirty-eight per cent of 951 cases showed disturbance of the heart.

Palliative treatment consists in measures to control hemorrhage. These consist in rest in bed, vaginal tampon, ergot, and adrenalin administered hyperdermatically, thyroid extract, and various preparations of lime. Electricity and X-ray do little more than control hemorrhage, although in the Charity Clinic of Gynecology and Obstetrics, Berlin, fibroids are largely treated by the X-ray, excluding pedunculated submucous fibroids, degenerated fibroids, fibroids causing severe pressure and fibroids extending to the level of the umbilicus.

Operative treatment shows a mortality of three to four per cent. In my eighteen cases in which hysterectomy was performed I have lost one, or 5.5 per cent.

Myomectomy has only a limited field and is followed by a higher mortality and more eventful convalescence than hysterectomy, although Werder says that he has performed 536 hysterectomies, with mortality of 3.45 per cent, and 171 myomectomies with 2.33 per cent, more than one per cent in favor of myomectomies.

German statistics show seven per cent recurrence. Less than ten per cent bear children after myomectomy.

The author's preference is for abdominal hysterectomy, leaving a little endometrium for menstruating women. In others, the cervical endometrium is removed or complete hysterectomy performed. Transplantation of ovaries is of value in preventing climacteric disturbances.

Small tumors in the fundus may be watched. For others, operation is the treatment of choice. The mortality is less than the frequency of malignancy in operated cases.

PROSTATECTOMY CLINIC AT THE MEMORIAL HOSPITAL.*

By G. Paul LaRoque, M.D., F.A.C.S.,
Surgeon to Memorial Hospital,
Richmond, Va.

Gentlemen: This patient, 75 years old, is the victim of a very large uniform hypertrophy of the entire prostate gland. He has had symptoms for seven years, and I have occasionally had to catheterize him upon sudden change in the weather from warm to cold or after drinking beer. His urethra is 12 inches long. The gland, upon rectal examination, can be felt distinctly, each lobe about the size of a lemon. I have not even measured the residual urine, except when he had complete retention, for the reason that I saw no necessity for using the catheter, and we have avoided doing so except when it was absolutely necessary.

This patient is in the second stage of clinical symptoms and the diagnosis is very obvious. I have for two years looked upon the catheter as more dangerous than this method of prostatectomy, and have therefore employed the instrument only to relieve retention of urine.

He was brought into the amphitheater awake, without any preliminary preparation except a dry shave of the suprapubic region. His bladder is distended with urine. He has almost complete retention.

Dr. Young will place him very lightly under ether by the drop method with plenty of air, while we are making a suprapubic cystotomy under local anaesthesia secured by infiltration of one ounce of novocaine solution, one grain to an ounce. We perform the operation according to the technique of Squier, modified by a transverse incision. We now have a transverse incision through the skin and sheath of the recti, three fingers breadth above the pubic bone; vertical retraction of the recti and pyramidales and of the suprapubic fat between the bladder and abdominal wall. This exposes the bladder, easily recognized and distended.

A small puncture of the bladder permits the urine to flow out slowly to avoid sudden evacuation of the distended viscus. The patient is now sufficiently under ether for us to proceed with the enucleation. The bladder is incised in the transverse direction at the highest point, just beneath the fold of the peritoneum. To make the incision at a high point facilitates more rapid healing of the bladder wound and prevents making it in any point too low for rapid healing. With the patient in the Trendelenburg posture, the urine mopped out, leaving a dry bladder, we get a good exposure of the interior, showing very large bilateral and middle lobe hypertrophy, great elevation of the posterior urethral orifice, a stone about the size of the end of my little finger imbedded in the side of the urethra hugged by the left lobe. There are no stones, ulcers, tumors, nor diverticulae in the bladder. The wall of the bladder is slightly more than normal thickness and there are uniformly distributed, but small, trabeculae and the bladder is dilated.

With the ungloved index finger of the right hand inserted in the posterior urethral orifice until the triangular ligament is felt, about three inches in this case, and the index finger of the gloved left hand in the rectum, the prostate is held firmly and the enucleation is begun within the urethra. By moderate pressure against the roof of the prostatic urethra, the two lobes are easily separated, the line of cleavage on both sides immediately detected. There is no false capsule in this location, and by sweeping the index finger around first to the right side and then to the left, the entire gland is removed about as quickly as it can be told. In this case, on account of the large size of both lateral lobes, it will be impossible to deliver the entire gland through the wound in the bladder without making the bladder wound larger. The lobes easily break apart, and first one and then the other is pulled out and exhibited. The prostatic calculus is removed, placed back in its original position in relation to the left lobe of the gland for exhibition.

You will notice that there is very little bleeding; this is because the plexus of veins in the false capsule of the gland have not been torn. During the enucleation, beginning in the urethra, the finger does not separate the layers of the false capsule, but peels the gland away from it by enucleating from the urethra toward the bladder. To be certain, however, that all oozing is checked and small particles of material removed, we shall irrigate with hot sterile water from the meatus, into the bladder and out through the suprapubic wound. This at once returns clear, the ether is now discontinued, a two-way irrigating tube is sutured into the bladder wound and the abdominal wound closed with silk worm gut.

I would call your attention to the very light anaesthesia. He has at no time been deeply anaesthetized and will be talking intelligently before the dressings are applied. Dr. Young is particularly

*Conducted for the entertainment of visiting physicians at the meeting of the Southern Medical Association, Friday, November 13, 1914.

skillful in anaesthetizing these cases and rarely employs more than an ounce of ether.

The patient will be placed in bed under the care of a nurse whom we know to be qualified by experience and interest in caring for these particular patients. The post-operative treatment will consist of administration by mouth of large quantities of drinking water without ice. The patient will be encouraged by the nurse to drink at least a gallon or more if possible within the first twenty-four hours. This will cause irrigation of the bladder from above through the kidneys, the natural route. Ten grains of hexamethylenamin will be administered every two hours for three days. The patient will be given everything he wants to eat or drink and above all, kept warm in bed, free from drafts, and the wet dressings changed sufficiently often for the patient to be kept dry.

The suprapubic tube will be allowed to remain in two or three days, because this drains away some of the fluid and aids in keeping the patient dry, and from the amount of blood we can estimate whether or not he is bleeding.

In two or three days the patient is gotten up in a chair, the urine permitted to flow on to the dressings, which are changed sufficiently often to keep the patient dry. We do not insert the catheter into the urethra, we do not irrigate except when there is some real necessity for it. In a word, we try to let the patient rigidly alone so far as local treatment is concerned.

It is of the greatest importance, however, to give them the best possible nursing, allow them their normal habits, food of whatever kind they choose at whatever hours they are accustomed, the same kind of tobacco and liquors to which they are accustomed, and the nurse humors their every whim during convalescence. We consider it of the very greatest importance that no old man's habits shall be changed while he is sick, and above all we keep them warm and free from exposure. This is no time to convert one from warm room notions into a fresh air fiend.

After this technique we have encountered no hemorrhage nor any other bad effect. Doubtless many of you have recognized that this is the technique devised and practiced by J. Bentley Squier of New York. We have employed it for the past three years since it was first published in Surgery, Gynecology & Obstetrics, September, 1911, with perfect results so far as the technique is concerned.

We exercise no special pains to preserve the sexual powers, though in one case into which I have inquired they have been unimpaired since the operation three years ago. We regard the normal prostate as a sexual organ, but the prostate the seat of senile hypertrophy gives only urinary symptoms, and it is only this which we treat.

The seminal vesicles are not removed through this method of enucleation. The internal sphincter is left intact and incontinence of urine has never followed the operation. We have had no unpleasant sequelae of any kind. All the cases are cured.

Out of the dozen cases which we have done here in this hospital, we have lost one three years ago, a man 80 years old who had had retention and an inlaid catheter for two weeks. He was violently septic at the time of operation and at that time we did not fully appreciate the necessity of a preliminary suprapubic cystotomy several days or a week before the removal of the gland. We did the complete operation at one sitting, which we do not do now in cases in which there is infection. On the contrary we consider it of vital importance in dealing with every patient with impaired kidney function to do only the preliminary suprapubic cystotomy and this under local anaesthesia until all the infection has subsided and until the kidney function has improved. We emphasize this point.

I have been informed that two more cases are coming in this afternoon. These latter cases, however, will not have the radical operation performed to-day, because both of them are septic from catheterization. We shall do only the suprapubic cystotomy in the two septic cases.

Before every operation we investigate all cases with the greatest care, especially with reference to the kidney function, cardio-vascular and pulmonary conditions. In estimating the kidney function we regard the general clinical study of the patient as of more importance than any laboratory test, but we use the phthalein test of Geraghty in many cases in conjunction with clinical and laboratory studies. We realize that the greater the output of phthalein the less the risk, but we have not reached any conclusion as to how much output will indicate safety or a prohibitory risk.

We do not cystoscope them nor in any way traumatize them locally; our whole effort so far as the bladder and prostate are concerned is to avoid injury and infection and to place the bladder, prostate and urethra at physiologic rest. When the urine is fairly clear, as in this case, and the patient's condition is fairly good, we do not hesitate to do the entire operation at one sitting.

Note—The patient made an uninterrupted convalescence, the tube was removed at the end of the second day, patient sat up the third day and wound was completely healed at the end of two weeks, and, instead of getting up every half hour

during the night as he had been doing for the past five years, he has to get up only two or three times, and this is due to habit.

The profession and humanity are greatly indebted to Dr. J. Bentley Squier for elaborating the technique of this simple and effective prostatectomy.

I thank Dr. Frank Hodges for his attention to the patient's general condition during convalescence.

REFERENCE TO AN UNUSUAL CASE OCCURRING TWENTY YEARS AGO.*

By Samuel R. Benedict, M.D.,
Birmingham, Ala.

Gentlemen, I feel that I am due you an apology for reporting a case which is not my own, but one which occurred in the practice of my father some twenty years or more ago. However, you may feel that I am justified when you hear the report of the case, as the condition is one which is very rare and the operation performed was the first of its kind on record at the time to be attended by success. I might further add that the author, who is no more, after reporting this case, was the recipient of many letters of congratulations from prominent surgeons, not only in this country, but abroad. The paper deals with an operation on a child fifty-three hours old, and I have here a picture of the patient before the operation and also a small one showing the boy as he is today. He has just graduated from one of our largest Southern universities, and is a fine specimen of manhood, 6 feet tall and weighs between 165 and 170 pounds, and from all appearance is a perfectly normal man. The title of the paper which I am to read to you tonight is:

AN ENORMOUS CONGENITAL UMBILICAL HERNIA WITHOUT CUTANEOUS COVERING, OPERATION AND RECOVERY.

At 6 a. m. Saturday morning, January 9, 1892, I delivered instrumentally Mrs. B. C. E. primipara, age thirty-three, of a large male child, approximately 10 pounds in weight, well formed and rounded and perfectly developed with the exception of the anterior walls of the abdomen around the umbilical cord as described below. Presentation normal. Upon raising the bed clothes to tie the cord, I found a protrusion of the abdominal viscera through a circular opening in the abdominal wall four inches in diameter, the tension upon the cord assisting in pulling out the contents considerably. Instantly tieing the cord and dividing, I handed the child to the nurse with directions to say nothing, but to keep her hand firmly pressed down upon the protruding mass. After giving the mother proper attention, I had the child moved to an adjoining room for dressing, and there upon further examination found the following condition: There was an entire arrest of development in the skin and muscles of the umbilical region of the abdomen, the edges of the skin forming a perfect circle with radius of two inches, adherent by a rounded edge to the peritoneum and covering of the cord, which spread over the whole peritoneum, covering the mass. The umbilical cord passed out from the lower edge of the hernia about one and one-half inches above the pubis.

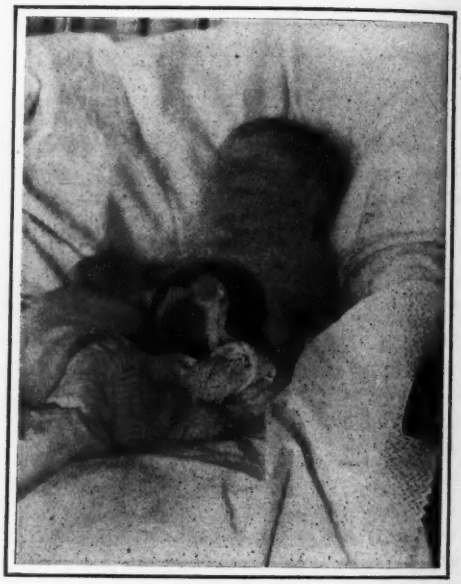
The color of the mass at birth was a dark, bluish-black, and the covering so thin that the movements of the viscera below could be seen. Realizing that I had a desperate case to deal with and undecided just then what to do, I covered the whole mass with dry bichloride gauze, bandaged firmly with a flannel bandage an inch and a half wide, and had child dressed with directions given as explicitly as possibly to handle carefully and prevent crying as much as possible. The same day I began to hunt up authorities upon umbilical hernia and failed absolutely to find in any work on surgery any report upon or instruction for dealing with such a case. Wyeth, Erickson and a number of other books were searched, but in vain. In Gross Surgery, Vol. II, page 712, issue of 1859, is a very accurate description of the condition, and the only thing of the kind I could find. He says, "When umbilical hernia is large, death usually takes place a few days after birth from the effects, apparently, of peritoneal irritation. If the child survives an attempt may be made, etc." Seeing no chance for this child to survive with the large area of peritoneum to be exposed when the cord covering should slough off, I decided that there was nothing to do but to attempt the operation. Accordingly, on Monday, January 11, at 11 a. m., 53 hours after birth, the operation was made. I

*Read before the Jefferson County (Alabama) Medical Society, January 18, 1915.

began by attempting to dissect up the now dead and yellowish white membrane covering the peritoneum.

This was a very difficult part of the operation, as it was firmly bound down to the external surface of the mural peritoneum, and the dissection had to be carefully done. The peritoneum was as thin as a cobweb and tore upon the slightest tension, exposing more than once the cavity. After dissecting off as best I could to the skin circumference, I divided closely down the umbilical cord and vessels, now a dried and shrivelled mass, and giving no blood upon section. I had hoped that I could pare the rounded edges of the skin, invaginate by tension upon skin the peritoneum, and so approximate in a perpendicular line the skin from sides of abdomen. This was found impossible, as besides the firm union of the skin to the peritoneum, the liver and spleen occupied a large portion of the wound, intestines being only in the lower portion. I then penetrated the edge of the skin with a fine pair of curved, sharp pointed, conjunctival scissors and cut closely to the peritoneum the skin all the way around, leaving a circumference of skin still attached to the peritoneum. The skin was then dissected up sufficiently to make close approximation of subcutaneous surface and not the edge of the skin. This was held together by three silver pins wound with silk in figure eight way, and intermediate approximation done by black silk sutures. The line of approximating about four inches long and perpendicular was dusted with iodoform, covered with rubber tissue in narrow strips, bichloride gauze cotton and a firm bandage.

The operation lasted fifty minutes, the child, two days old, taking in all ½ ounce of chloroform, rallying promptly and in good condition. Directions were given for one drop of paregoric every hour or two if necessary to quiet the child, and we left not expecting the little one to be living 48 hours hence. We were disappointed. There was never any elevation of temperature or abnormal rapidity of heart's action, the child resting nicely, with but very little paregoric, not averaging a drop in five hours. The wound was not examined until the third day, then it was found that the skin had become adherent over the peritoneal surface and all along the line of approximation. There was considerable cutaneous redness an inch around the wound for a few days, but this gradually subsided. Upon the fifth day it was found that the tension had caused the silver pins to loosen, and they with sutures were removed and their place supplied by adhesion strips. On the 10th day it was found that the great intra-abdominal pressure had separated the cutaneous edge for about an inch in length, exposing a granular surface over peritoneum 1-4 inch in its widest part. This was strapped more firmly, and a laced adhesion bandage passed around the body, the lacing being over the wound and dressing. This answered admirably and has kept the parts so well at rest that today, January 30, there is complete union. The child has never acted other than any child of its age. It has nursed regularly with avidity, his bowels and bladder acting normally. Paregoric has been used occasionally, chiefly at night, but never over six drops during the night.



Before operation.

There is now nothing to show for the hernia but the line of cicatrization four inches long, which is a finer truss than anything else could be. When he cries or strains there is a slight rounded bulging at the umbilical opening, but not enough to give cause for further uneasiness, and this is kept down by a silk elastic bandage four inches wide and 13 inches long, made by Williams & Co. of Baltimore. The child of course has no navel and never will have. If he lives he may be the envy some day, on the Tom Sawyer plan, of his fellows in bathing.

If he lives he will be a strong argument in favor of a strictly aseptic operation, and of the cure of a condition which I doubt if ever has be-

fore been made by an operation. Have any of my readers known of such a case?

AUTHORS' ABSTRACTS.

Surgery, Gynecology, Obstetrics and Genito-Urinary Diseases.

Syphilis of the Oral Cavity. By W. Pettus Dey, Jacksonville, Fla. Journal of the Florida Medical Association, February, 1915, pp. 230-232.

The manifestations of the different stages of syphilis of the oral cavity as differentiated from the various forms of stomatitis, and cancer as well as some rare conditions as burns, hydroea, Vincent's angina, etc., is brought to the attention of the dental surgeon not only from a diagnostic standpoint but for his personal protection as well.

In view of the fact that not a few are infected who are not themselves cognizant of the fact, a large number of syphilitics deny the infection to any but their medical adviser.

The dentist is advised to exercise extreme caution when dealing with any mouth which presents an ulceration (especially a perforating ulcer of the soft palate) no matter how small or innocent it may appear, and summarizes as follows:

1. It is practically impossible by inspection alone to differentiate syphilitic from nonsyphilitic sores and is only possible by means of laboratory methods.
2. Syphilitic ulcers of the mucous membranes of the mouth are highly contagious, in fact the most contagious of all specific ulcers.
3. It is a safe rule to look with suspicion upon every ulcer of the mouth, throat and tonsil.
4. In view of these facts it should be the duty of every physician who has knowledge of this condition in a patient to confer with the dentist regarding the infection when referring him for dental work.

Treatment of Fractures. By B. F. Zimmermann, Louisville, Ky. American Journal of Surgery, March, 1915, pp. 90-96.

The author presents a resume of the subject of fractures and their treatment. Nearly all the varieties of fracture are adequately described, and the most suitable method of treating each type fully outlined. The views of many authors are carefully abstracted and presented.

In comparing the work of abdominal surgeons with that of "bone surgeons," he remarks that the treatment of bone lesions is today the most difficult of all surgery, requiring a technical fineness scarcely known to abdominal surgeons of twenty years ago, and possessed by comparatively few of the present.

The two recently developed greatest factors contributing to the more successful management of fractures are: (1) radiography, and (2) the open method of treatment. While Lane may plate successfully all his simple fractures, and Murphy may secure union in ununited fractures by bone transplants, such radical procedures will always represent a small portion of the fracture work required of physicians and surgeons.

The primary object in treatment is to secure good functional results. Experience has shown that nearly all cases of "non-union" are merely "delayed union." In the majority of fractures physiological use is the best agent to assist in making union solid, but protection by artificial support is required even after the fragments appear firmly united.

Open treatment is indicated only in aseptic surroundings with the most rigid adherence to aseptic technical details; otherwise the closed method is safest in the best interest of the patient. Operative treatment may be undertaken at any time within ten days after the injury.

Some Mistakes in Obstetrics. By J. H. Graves, Waco, Texas. Texas State Journal of Medicine, March, 1915, pp. 466-468.

(1) Mistakes of Omission: Failure to overhaul obstetrical case. Failure to have on hand perineum needle and holder; sterile forceps; five yards boiled and dried cheese cloth; kitchen table strong and clean in room to operate upon if necessary; reinforce bed with more slats, if no table is available. Failure to have your patient ready. In primipara make external measurements as soon as consulted. Administer a little anaesthetic just as head is born. Retract foreskin of male babies at birth, and instruct nurse to retract it daily for several days, anointing with sterile vaseline. Crede's method of instilling 2 drops 2 per cent Sol. Arg. Nit. in each eye; follow immediately with sterile normal saline previously prepared. Determine position and presentation as soon as possible. Delay in use of forceps, when indicated, often destroys the child, but seldom ever hurts mother much.

(2) Mistakes of Commission: Too frequent and too rough digital examination. Unnecessary haste in use of forceps, and unnecessary use of forceps. Resort to basiotribe, when patient manipulation, plus pituitrin, judiciously given, would deliver child. Unsterile hands, instruments and dressings is criminal. Leaving perineum lacerated and unattended to. Instructions given to women to lie on their backs too much after delivery cause retrodisplacements et al. Unnecessary use of pituitrin. Tie cord with sterile ligature, dust stump powder. Boric acid 1 part, talcum three parts. Leave off all dressings, no binder, no nothing. Thus the mother or nurse can see stump at all times, and no hemorrhage can occur and escape quick detection.

Thoracotomy in Unresolved Pneumonia. By Randolph Winslow, Baltimore, Md. Surgery, Gynecology, and Obstetrics. March, 1915, pp. 350.

The author reports two cases of pneumonia in which symptoms did not subside at the usual time and empyema was suspected.

The first case was that of a boy of sixteen years with a lobar pneumonia which failed to clear up, and an empyema was suspected. Aspiration failed to discover pus, but it was decided to do thoracotomy. This was done under nitrous oxide and oxygen anaesthesia. No pus found, but lung was hard, non-collapsible and adherent to chest wall.

The adhesions were released and a drainage

tube placed in pleural cavity for a few days. Improvement was almost immediate, and recovery soon followed.

The second case: A man, thirty-four years old, with a suppurating tuberculous bubo. Temperature normal, leucocyte count 8,200, hemo-globin 95 per cent. The lump was removed under ether anaesthesia. For some days he did well, then he was taken with a stitch in left side with friction murmur, and later signs of consolidation of lung. His temperature was irregular, from normal to 105, with chills, sweats and rapid pulse, 120-140. The leucocyte count was 23,600; no malarial parasites could be found. Aspiration failed to detect pus, but as his symptoms continued without improvement it was determined to explore the left thoracic cavity. This was done under gas-oxygen anaesthesia. No pus was found, but the hard consolidated lung was extensively adherent to the thoracic wall. The adhesions were broken up and drains introduced. Improvement began in a few days and convalescence was soon established.

Gun Shot Wounds of the Abdomen. By Hugh S. White, El Paso, Texas. Bulletin of the El Paso County Medical Society, March, 1915, pp. 9-15.

Of seven cases reported the one not operated, which at autopsy showed only a small wound of the stomach, gave a mortality of 100 per cent.

The six cases operated, each having from two to seven perforations of the intestines, gave a mortality of 33 1-3 per cent.

One of the operated cases died on the sixth day from a complication, but at autopsy showed the sutures to be holding perfectly, thus indicating to the author that his method of suturing the intestine can be relied upon.

The suture used is recommended on account of its effectiveness, and the ease and rapidity with which it can be introduced. It consists of a through and through continuous suture of chromic catgut, including all of the layers of the intestinal wall, reinforced by a continuous Lembert suture of fine silk. The deep suture is certain to be infected and catgut is used on the theory that any infection between the two lines of sutures will break more readily through the catgut into the intestine than it will through the silk into the abdominal cavity.

The author emphasizes:

1. Using a continuous single suture, thereby saving much time and annoyance, first catgut, second silk.
2. Picking up the edge of the intestine with rat-toothed forceps to hold it firm when introducing the needle.
3. Using plenty of drainage.

He warns against:

1. Using clamps on the intestine.
2. Keeping the patient on the table any longer than is absolutely necessary to perform the operation.

Achondroplasia. By W. Atmar Smith, Charleston, S. C. Journal of the South Carolina Medical Association, March, 1915, pp. 79-85.

Achondroplasia is a dyscrasia of the cartilages. The term indicates an absence of cartilaginous bone formation and hence is inaccurate, as cartilaginous bone formation does occur but is, according to the "criterion of priority," the correct name for the condition. Pathologically it is a dystrophy of the epiphyseal cartilages. The bones chiefly affected are the long bo· of the extremities, the innominate, posterior part of the skull and its base.

The etiology is unknown.

The symptoms are large, domed-shaped head, long body and short extremities. The subject presented was 55 1-4 inches in height. The distance from acromion to great trochanters 19 inches, from trochanters to external malleolus 23 inches. The normal difference in these distances is 12 to 14 inches instead of 4 as in this case. Another significant point is the short proximal and long distal segments. From trochanter to condyle was 11 inches; from condyle to malleolus 12. The same relative disproportion is noted in upper extremity. The hand is an important characteristic, short fingers nearly the same length and sometimes trident shaped. Changes in the pelvis are of obstetrical interest; frequently the women have to be delivered by Caesarian section. These dwarfs are well developed sexually.

The diagnosis is easy. It must be differentiated from dwarfism, due to rickets, cretinisms and infantilism.

The short statue of the rachitic dwarf is due to twisting of the legs.

Infantilism is the retention of youthful proportions into adult age. His contour that of a chil', and there is an absence of secondary sexual development.

The myxoedematous dwarf is easily distinguished by the oedema.

General Management, After Care and Treatment of Normal Labor. By D. C. Homan, Oglesby, Texas. Texas State Journal of Medicine, March, 1915, pp. 471-472.

The first essential thing in obstetric practice is careful case history and then keeping up with case until confinement. Also careful examination at confinement and absolute cleanliness. Sterile rubber gloves should always be used. Just as important as sterile field. Pituitrin is very serviceable in normal cases with proper amount of dilatation. Chloroform should be used sparingly in majority normal cases. A few whiffs when head is on perineum, instructing patient not to bear down will prevent most lacerations.

Tie cord with sterile tape touching end with tincture iodine or some antiseptic. Point it upwards; don't grease. Don't use douches after confinement. Instruct patient or nurse to use nothing but absolutely sterile clothes to absorb discharges with sterile sheet over and beneath patient. After the first twelve or twenty-four hours put patient in Fowlers' position. I think this is very important. You must have drainage.

Patient should be allowed to get up for stool and encouraged to change her position often. The bowels and kidneys should receive attention for first few days. Good nourishment, with plenty of fruits and small doses of quinine will suffice in most cases.

RAILWAY SURGERY

REMARKS ON COMPOUND FRACTURE AND DISLOCATION OF THE KNEE JOINT.*

By Joel Crawford, M.D.,
Yale, Va.

I have selected this subject chiefly because I could report a case that came under my observation several years ago.

Ashhurst says that compound fracture of femur, involving the knee joint, should almost invariably be considered a case for amputation.

White & Keen say compound fracture, involving knee joint, commonly calls for amputation, because of the great damage to the soft parts, while similar injuries to ankle joint may admit of conservatism if the parts can be rendered aseptic.

Compound dislocations of the elbow, shoulder and hip, provided only moderate injury has been inflicted upon the soft parts, should be treated by excision as a rule.

Moullin says it is more important to distinguish those cases in which inflammation has not yet occurred from those in which it has already broken out (and the operation is performed with the view of saving the patient from acute septic poison), and from those in which the tissues have recovered and are beginning to protect themselves by throwing out a barrier of granulation.

Cases of open fracture of the femur, extending into the knee joint, and complicated by luxation of the joint, all die or all get well.

In the fatal cases you will find that there is a marked deficiency of bone supply, nerve supply, but more especially blood supply of the joint.

In the so-called recovery cases the limb is very much distorted, and the patient is more or less maimed and crippled for life, and on the whole, I think amputation is preferable.

Should the injury render amputation necessary, it should be done in the primary stage or immediate, and not the secondary or consecutive stage, for obvious reasons.

As you all well know, amputations are classified into primary, which is done before the development of inflammation, a period rarely exceeding twenty-four hours, though, if there be much shock, it may reach to forty-eight hours, or possibly still longer, from the time at which the injury was received.

A better classification, I think, however, is that of military writers, who made a third class, the intermediate.

Inasmuch as I advocate amputation in all cases of open fracture of the femur, extending into the knee joint, with luxation, it might be well to mention the time at which the operation should be done, as it would exercise an important influence over the result; thus, amputation for acute affections of the bones or joints are much more fatal than those of chronic diseases of the same parts.

It should be done in the primary or intermediate stage, a period which I have already mentioned, rarely exceeding twenty-four hours, though if there has been much shock, it may reach forty-eight hours, or possibly still longer from the time at which the injury was received.

If by any chance the golden opportunity has been lost, and the intermediate stage of military writers has come on, operative interference must, if possible, be postponed until inflammation has measurably subsided, and until the patient's condition has become assimilated to that of a case of chronic disease, rather than of traumatic lesion. In fact, the general impression has been confirmed that the so-called intermediate operations of the military writers are very fatal, and that those

*Read before Southern States Association of Railway Surgeons, Auxiliary to Southern Medical Association, Richmond, Va., Nov. 9, 1914.

done when the inflammatory symptoms have subsided are comparatively successful.

Miss D., aet 12, and her friend, Miss W., while returning home from church one afternoon in a buggy, driving rapidly in order to get under shelter before a rain-storm would come up, the wheel collided with the gate post, throwing them out. Miss W. sustained a contusion over antero-lateral aspect of the left thigh, which soon got well. Miss D.'s right leg slipped between the spokes of the wheel during its revolution, resulting in open fracture of the femur, splitting off the internal condyle, considerable periostium was denuded from the lower end of the bone, which, on my arrival, was protruding from beneath the patella.

I advised amputation, as did my consultants, but the parents and the friends of the patient stated that they preferred death rather than amputation or any operative (surgical) intervention.

We reduced the dislocation under chloroform anaesthesia, and placed the limb in as good position as we could under the circumstances, and treated the wound antiseptically but, after a time, the suppuration became so marked and continued so long that I feared amyloid degeneration of the kidneys would make its appearance.

I saw the patient and dressed wound every day, save one, for four months, and more than two years after the reception of the injury I was called to open a couple of abscesses near the joint, many pieces of dead bone made their exit, and I have been informed that the original sinus is still discharging.

There is anchylosis of the joint, including those below the seat of the lesion, and the limb is very much distorted.

REFERENCES.

Ashhurst.
Moullin.
White & Keen.

DISCUSSION.

Dr. Southgate Leigh, Norfolk, Va.—I am very anxious to get an expression from the representatives of the railway systems here present in regard to the treatment of compound fractures in general.

If it is not out of order, I would like to discuss the question in connection with the doctor's paper. I have mentioned it at a number of railroad surgeons' meetings, and I find that very few agree with the position that I have always taken as to the handling of compound fractures. I will state briefly the method that we pursue, and I do not know why it is that it is not in more general use. I hope that there will be free discussion and criticism.

I have, ever since I have been practicing surgery, treated compound fractures by operation, thorough antisepsis, free incision, the best coaptation of the bones, without foreign material, if possible, if necessary with foreign material: wire or bone splints or plates. Then the wound is closed without drainage material, but so loosely that there will be no excessive retention of fluid in its cavity; the application of a compressing dressing which will also help to obliterate free spaces. Now our experience by that treatment (which I have very briefly outlined) has been almost universally successful. Our cases have healed, practically all of them, by first intention. The only cases that we have had any trouble with are those cases that have come to us two or three days after the accident. If they come to us in a few hours, we never have trouble. The bones unite much more quickly than in the ordinary treatment of compound fractures.

Question.—What do you mean by fixation?

Dr. Leigh.—I have not touched on that point particularly, because there is so much difference of opinion in regard to it. Of course in compound fractures, if we can get along with absorbable materials only, it is very much better. Wire or nails or plates are more or less apt to cause some after irritation. In these cases we use antisepsis freely and then treat them as clean wounds, the main difference in the treatment being that we leave more space between the sutures and possibly put on more of a compressing dressing. The bones unite in some six or seven weeks. Of course they take a little longer than simple fractures, but there is great saving in time, suffering and danger over the old-fashioned open method of treatment, which even today is often practiced.

Dr. W. F. Smith, Little Rock, Ark.—I am glad that Dr. Leigh brought up this phase of the question, for I think it is especially good for the railway surgeons and quite an important matter, particularly the end results, because if the patient does not settle with the company and brings a suit (as a good many of them do in Arkansas, both white and black), and has a bad looking limb to show the jury this will enhances the value of the verdict against the company. Now, I think, in treating fractures, the restoration of the function is of the first consideration. The restoration of the contour is secondary. I have—fortunately or unfortunately—in the past year and a half had quite a good many compound fractures to deal with. I remember three cases of compound comminuted fractures of the femur, and in all those cases I went in, making a free incision and applied a long Lane's plate and closed the wound with drainage, expecting infection and was not disappointed. I had one case in the hospital for six months, and when he went out his knee was partially stiff. I think that was partially due to my own fault. In fact, I am sure it was, because I did not do as in the other cases, employ passive motion right from the start. I think that is one thing you have to be careful about, employ early motion or you will have a partial ankylosis of the knee joint.

Another case was in the hospital for nine months. He was riding on a motor car and an

iron bar fell off and pierced the leg about the mid-the thigh, producing a fracture of the thigh. I employed passive motion in his case at the start, and when he was dismissed from the hospital there was a very slight deformity, on account of a slight bulging out, because I put him up to walk just as soon as I could, but he has a good functional result with a slight deformity of the contour. The X-ray shows a slight callus thrown out, but he has a good limb, which is something to him.

Another case in the hospital now—patient was watching a train go by and the train hit him, producing compound fracture of the femur, pushing the bone through the trousers.

I use nothing but the iodine in sterilizing, and when I get through, I pour iodine in the wound, then turn the leg over and let it run out. There is a slight infection in this case, but each day I bend the knee, and the fourth day afterward he could raise the leg and splint from the bed, and I look for good results in this case.

I recall three cases of compound comminuted fracture of the tibia. In one of the cases a man over 56 years old, there was a delayed union. I had a Wassermann made, which was negative. I gave him hypophosphites and then put a cast around his leg extending from just below the knee to the ankle, and cut it open and packed it with cotton, so as to allow for the swelling, put him up on crutches and made him walk, and in about six weeks or two months there was a good union there and he was discharged. I saw him a few months ago and he was walking around without a cane.

I close these cases—cases where there is great injury to the bone and soft parts it is difficult to hold the bones in apposition—after I put on a Lane's plate and then I always remove the Lane's plate, because I think they are foreign substances, and after they have performed their function they have no further duty.

Dr. J. L. Miller, Thomas, W. Va.—I enjoyed Dr. Crawford's paper very much, but I wish more to speak in regard to Dr. Leigh's comments on treatment of compound fractures. In our railroad and mine work we have quite a number of these to treat, and our routine procedure is almost like Dr. Leigh's, and our results are much the same. We enlarge the wound and clean out thoroughly any loose spicules of bone, foreign matter, etc. Where we can get apposition and maintain it without any drilling of the bone, we do not do it; otherwise, we drill the bone and unite the fragments with chromic gut or kangaroo tendon. We do not use plates. Usually close the wound with the exception of one or two stitches, which are tied loosely in a bow knot, dress the case in twenty-four hours, and if there is no occasion for leaving the wound open, these stiches are tied in the usual way. We also put on compresses to occlude any cavities that may be left, and our results are almost 100 per cent healing by primary union, without infection.

Dr. L. E. Burch, Nashville, Tenn.—A compound fracture produces a wound that is almost always septic and requires great care in its management. The surrounding tissues should be rendered as clean as possible by the application of iodine, or iodine preceded by gasoline. If any dirt or tissues are to be removed, scissors and forceps or the knife and forceps should be used for their removal, taking great care to keep instruments out of the wound that have come in contact with the operator's hands or even the gloved hand. I agree with Dr. Leigh on one point, and that is that if a clean incision is necessary, it should, of course, be made; but after the fracture is reduced, I do not believe that the Lane's plate, sutures, wires or any foreign material should ever be applied to a compound fracture. I think the application of foreign material to a compound fracture is very dangerous teaching. The first thing of importance is to render a compound fracture a simple fracture. When this is accomplished, then a reduction of the fragments can be made.

Dr. J. N. Baker, Montgomery, Ala.—One point in the treatment of compound fractures which I think well worthy of consideration; the giving of the immunizing dose of anti-toxin for the prevention of tetanus. I have, in the last year, lost two cases from tetanus, and in the last six months I have systematically used it, with good results, and I think in every compound fracture we should give the immunizing dose.

Dr. J. J. Waller, Oliver Springs, Tenn.—I had a case of gunshot wound of the forearm, the bullet fracturing both bones; it came to me three weeks after it happened. The whole arm was infected and swollen. The pus was not only about the wound and ends of the fractured bones, but extravasated the soft tissues about the elbow joint. I washed the wound through and through on general principles and injected Beck's Bismuth Paste. It seemed to cleanse the whole wound, and a good recovery was the result.

Dr. E. T. Dickinson, Wilson, N. C.—Always, when I hear Dr. Leigh is to be present with his speech on compound fractures, I try to be there myself, not because I want to "come back" at Dr. Leigh, but because I am afraid that I, as an ordinary surgeon, will not be able to do as nice, clean, perfect work as Dr. Leigh. I am very much afraid that if the method were to be generally adopted by railroad surgeons who have not the facilities, and those of us who have not the exact elements of surgery always with us under all conditions, as Dr. Leigh has, I am very much afraid that the results would not be as encouraging as they are under our present plan of treatment. My understanding is that every compound fracture is infected, and that the more grinding and manipulation that is done in this wound at the time, the more severe and extensive is the infection; and, theferore, I prefer to wait until antibodies have come to the rescue in this infection of the system before these operative measures are instituted.

If I should get a compound fracture, I should want mine done in Dr. Leigh's method if all facilities were at hand, but as a general adoption, under general conditions, I do not feel that it is the safest plan of procedure.

Dr. C. H. Vaught, Richmond, Ky.—I am unable to understand the argument and logic of the surgeon who wishes his wounds dressed one way

while he would dress those of his patients in another way.

I wish to go on record as endorsing and supporting everything said by Dr. Leigh. I am sure I do not know to whom he refers that has fought him in the position he now takes. The fact remains that he has gotten results, and that is just the thing that alone counts.

I believe in cleansing these wounds with iodine. I am far from being old or an old fogey about anything, but we have had too much of this thing of experimentation. I think I may be pardoned for the suggestion that if a doctor—as much as I love them—should apply a Lane splint to my fracture, I would feel like murdering him. And that reminds me of the resection of some four to six feet of the big gut for relief from digestive troubles there. I think these gentlemen call this short-circuiting. No section for my lack of digestion—not on your life.

Now we believe that when we have put the bones in apposition and put on a fixed dressing that will keep them there, after thorough disinfection, we have done all that is required in good surgery, and all I am sure that is necessary. Plaster of Paris will act admirably, is easy to obtain and apply. I have had four recent fractures at or near the ankle joint, two of them compound fractures. They were treated as simple wounds, fully and freely sterilized with iodine, and the results were perfect in evry way. The best antiseptic, of course, is iodine, pure, or half diluted with alcohol. After this application we might apply 5 per cent iodine gauze. If properly done we should not worry about sepsis, for we won't have it.

I have never been so unfortunate as to have a fracture of the knee or of any other joint in myself. If I should, however, I would wish it treated as I have outlined above and as has been suggested by Dr. Leigh. So you will observe that I want to be treated just as I would treat the other fellow.

Dr. A. K. Kessler, Huntington, W. Va.—If I broke my leg at the hospital door, I would want it treated like Dr. Leigh does, but otherwise I would want it cleaned with iodine and gauze, and warm applications; put it so that we could get the best blood supply possible, because, if we go in there and operate on a limb and put those plates and wire it together, the blood supply is bound to be lessened. That will do for those who have hospitals, but we people in the "sticks" have got to look out for infection. Treat that wound as a simple fracture for awhile, put it up with heat until we can be sure there is no infection there, then we can go on and put the Lane's plate or the Plaster of Paris casts, and we can get the results—that is, in small places.

Dr. H. P. Linsz, Wheeling, W. Va.—I do not think we can improve on Dr. Leigh's method. When it comes to ourselves, we are a little different. The idea is to reduce a compound fracture and make a simple fracture of it, but I do not agree with him on the gasoline business. You are liable to wash something into the wound. I believe in the iodine treatment. Sew your wound. Run the risk of healing by first intention. If you have to suture the bone, as the doctor remarked, with kangaroo tendon or catgut, I use pedicle silk, and it stays there.

In regard to walking where angels fear to tread: Where the bones stick out there are already irritated tissues there. I saw off those ends and you can have new, bony formation a good deal quicker and use any splint application to the case. You cannot use any special method on those cases, but the best method you can use on that special case. I have no use for Lane plates. None at all. I have never used one and if I ever did, they would come out.

The clamp treatment Dr. Eve spoke of at Lexington last year was very good, but I think the less we do with these cases the better we are, and I believe if we will use a little kangaroo tendon and tie it loosely, then if you need to open it up you can do so.

Dr. Leigh: Our president has shown he is very much interested in this subject and we would like to hear from him.

Dr. Duncan Eve, Nashville, Tenn.: We are much interested in the subject of fractures. Until recently I was on the fence in regard to immediate operation for fixation of fragments in a compound fracture. The last time we did an immediate operation, some three years ago, was upon a patient with a compound fracture of the tibia high up (with a vertical line fracture), running into the knee-joint, the result of a mule kick. This case was sent to our Institution very soon after the accident and after taking sufficient precautions to prevent infection, as we thought, made an operation and fixated the fragments with small staples. In two days the rankest infection was manifest, and while it was claimed to have been a white mule that produced the injury, we resolved not to be in such a hurry again soon.

The concensus of opinion now regarding the treatment of compound fractures is that there should be no immediate operataive interference, even if reduction is not possible. My belief, from rather an extensive observation, is that all compound fractures should be treated as if infection had occurred. The opening into or through the soft parts should have tincture of iodine (full strength) liberally applied, a piece of sterile gauze placed over the wound, while the part is shaved and scrubbed with benzine. The benzine removes the dirt and grease and does not interfere with the subsequent disinfection of the part, as does soap and water, which should not be used.

It is best to allow the wound to heal, which, in a majority of cases, is not longer than two weeks; then the fracture can, if necessary, be treated by operation in the usual way without much danger of infection or reinfection.

These wounds should not be explored, especially by the finger, if only a "first aid" dressing is employed and not disturbed further than making this simple dressing, it is astonishing how quickly they heal.

As to subsequent treatment that is required, reduction of fragments and especially means of fixation, would suggest that it depends largely on the special fracture; the vast majority of cases require an open operation for perfect approximation of fragments, for removal of tissue or piece of

loose bone, etc., between the fragments. As to the manner employed to hold the fragments, no one plan as Lane's will answer best in all cases. Thin vanadium steel, silver plates, staples, external clamps and sometimes even catgut can be employed. The material must be suited to the particular fracture.

I only employ drainage where infection is threatened or occurred before the case had been turned over to our care.

Dr. Crawford (closes): I have nothing to add to the discussion. I quite agree with Dr. Leigh and the other gentlemen.

My reference was solely confined to the knee-joint and I have had the open treatment and gotten good results. One was with a negro, a railroad man, who had a fracture of the tibia, and he got well and disappeared in six weeks and the claim agent told me he got off very easy with him for $80. As the gentleman from North Carolina says, we have to do the best we can, and it is not possible always to follow Dr. Leigh's plan.

TRAUMATIC EMPHYSEMA AND EMPYEMA.*

By E. T. Dickinson, M.D.,
Wilson, N. C.

The object of this paper is to advocate the formalin and glycerin treatment of empyema and to add some extreme cases to the list already so treated and reported.

The method is that of Dr. J. B. Murphy. He claims that it is capable of curing any empyema not connected with a branchus or other hollow viscus. After several years of experience with the method I am strongly impressed with its efficiency. The theory and the practical results accurately coincide.

In this method the pus is aspirated and through the same needle several ounces of a two per cent mixture of formalin in glycerin are injected. Following the first injection the fluid usually re-forms. After an interval of a week the process should be repeated. More frequent aspirations without injections should be done if demanded by dyspnea. After the third or fourth treatment, often earlier, the fluid begins to lose its purulent character and gradually assumes the appearance of clear or slightly reddish, cloudy serum. At this stage the injections are discontinued and the innocuous fluid is gradually absorbed. It is very important that the mixture be at least twenty-four hours old before using.

On September 16, 1914, a negro man about thirty years of age was referred to me with the history of having been jabbed under the left axilla by the blunt end of a board carried slowly along by a moving freight car. There was no bloody expectoration and other symptoms of severe injury were absent, except the extensive emphysema that appeared about the forty-eighth hour after the injury. This was of the interstitial variety and due evidently to injury at the root of the lung, the air traveling along the trachea until it reached the subcutaneous tissue of the neck and the chest walls, covering the neck to the ears, the cheeks and the chest.

On October 5th there were fever and other signs of empyema and six ounces of thick pus were aspirated through a large needle and four ounces of a two per cent formalin-in-sterile-glycerin mixture injected. On October 12th ten ounces of a more liquid pus were aspirated and six ounces of the formalin mixture injected. On October 21st twenty-four ounces of very fluid pus were aspirated and eight ounces of the formalin mixture injected. The following day another aspiration was done, removing fifty-four ounces of liquid pus, and eight ounces of the mixture were injected.

On the 28th the symptoms of empyema had almost disappeared and only one ounce of pus could be withdrawn. No injection was made at this time and there followed no further evidence of accumulation in the cavity.

A young child so long neglected with empyema that the pus had bulged up at several points above the left clavicle and between the ribs of the left side closely resembling multiple abscesses, was aspirated and injected without anaesthesia. Just at the termination of the procedure the child collapsed and was considered by both physicians in attendance to be dead. However, the child rallied and made a rapid recovery, with only one subsequent aspiration and injection.

I have had experience with several other less severe cases of empyema in children in which the method was used without complication, and with the greatest satisfaction. In no case that I have seen has there been a fatal termination, and no case has been burdened with a chronic fistulous tract so common after thoracotomy and rib resection.

*Read before Southern States Association of Railway Surgeons, Auxiliary to Southern Medical Association, Richmond, Va., November 9, 1914.

EYE, EAR, NOSE AND THROAT

TRACHOMA IN VIRGINIA.*

By Joseph A. White, M.D.,
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Richmond, Va.

I have practiced ophthalmology in Virginia for 34 years, and in that time I cannot recall having seen over a dozen cases of trachoma at my clinic, two of them being mulattoes, none being in a full-blooded negro.

In my office I have come into contact with probably five or six cases.

Nearly all of these cases were non-residents of Richmond and Virginia, temporarily abiding here, and in no instance was the disease contracted in the state.

In addition to these, I saw a number of cases about fifteen years ago, when on a visit to Luray, from some part of Page County, and was told there was a small epidemic of sore eyes in that locality, the mountain section between Page and Rappahannock Counties. The trouble was evidently brought there by some foreign visitor, and it must have gradually died out, as I have heard nothing of it in recent years.

The practical immunity from this dreadful affliction, which our local community here has enjoyed for so many years, has given us a sense of security which may be rudely shaken if we neglect the proper precautions.

Once it obtains a foothold among the poorer classes it is hard to eradicate, especially if over-crowding in tenement houses should confront us as our city grows, and this is almost an inevitable consequence of a rapid increase in population, as is taking place here. This state of affairs is already looming up for consideration among the negro inhabitants, who, whilst not so prone to contract the disease as Caucasians, are far from immune, as I and other ophthalmologists, who lived among them, thought for a long time.

The report of the U. S. Public Health Service on trachoma in Virginia and West Virginia, made by Dr. Taliaferro Clark, was a rough awakening to me from our fancied security against this disease, which so often results in blindness.

In the mountain counties adjoining West Virginia and Kentucky, viz.: Buchanan, Dickerson, Wise, Scott and Lee, trachoma was found endemic among the mountaineers, ranging from 13 per cent in Buchanan to three-fourths of one per cent in Lee. The infection in all probability spread from the adjoining counties of Kentucky and West Virginia. Buchanan County is bounded by McDowell Count, W. Va., on the north. and by Kentucky on the west, the contiguous counties being Pike, Letcher and Harlan, through which run the Pine Mountains, and through which the contagion was probably propagated from Leslie, Perry and Knott counties, where the prevalence of trachoma has been demonstrated by Dr. John McMullen, of the Public Health Service, and by Dr. J. A. Stucky, of Lexington, Kentucky.

I have seen no report of investigations in Pike, Letcher and Harlan counties, but it is a fair inference that they are equally infected in the adjoining region, as they are inhabited by the same type of people, with the same habits and customs and the same ignorance and disregard of sanitation and hygienic precautions. They still hold to the common towel and wash basin, one of the most prolific agents of spreading any contagious malady.

In addition to the trachoma discovered in the counties mentioned, Dr. Clark found three sporadic cases in the public schools of Bristol, and two in Abingdon, both towns in Washington County, and four among school children in Staunton, in Augusta County.

*Read in Section on Opthalmology, Rhinology, Otology and Laryngology, Southern Medical Association, Eighth Annual Meeting, Richmond, Va., Nov. 9-12, 1914.

Whilst the small number of cases in these towns may not constitute a distinct menace, they should serve as a warning to be on the alert, to nip in the bud, any chance of propagating the disease.

Each case is a source of infection for the family and other inmates of the home, and also for the children associated with it in the schools.

Early recognition of the trouble, proper treatment of the case, and the application of the usual hygienic and preventive precautions reduces the risk to a minimum. That the prevalence of the disease in our border mountain counties is a danger to be reckoned with is recognized by our State Health Board.

Whilst the mountaineers who are mainly its victims do not as a rule travel far from their rural abodes, occasionally they do wander afield to neighboring towns, and sometimes even to this, their capital city. Now and then some of them are brought here to be imprisoned for infractions of the law, and if perchance they should have trachoma other cases may develop. The type of the disease as shown by Dr. Clark is not a severe one, and this makes it only the more dangerous, because it is often not suspected and only found when specially looked for. The hardly noticeable discharge from such eyes may be a source of infections to others, and may spread the disease, as an unsuspected typhoid carrier may distribute typhoid fever. It is a serious problem for our health authorities to control the spread of trachoma.

If it has spread from Kentucky and West Virginia into the Virginia border counties, how are we to prevent its passing on into adjacent counties, and ultimately by travel to our towns and cities? Fortunately our towns, with the exceptions already given, seem to be entirely free from this evil.

I wrote to every ophthalmologist in Virginia, and whilst some of them did not reply to my letters, enough did so to enable me to say, that so far as their experience goes, Virginia towns are exempt from this affliction.

In order to keep this favorable aspect of affairs our health board proposes to establish a small hospital in the infected area, at the most convenient point, for the treatment of trachoma, with several substations where most needed. This will help much in localizing the affection, and if to this is added a campaign of education, or instruction for these people, on the dangers to eyesight of this particular type of sore eyes, they may be awakened to the necessity of taking proper precautions against its spread. Many of the local physicians need arousing on this subject, as well as their patients, and it is only by the greatest publicity of its importance that we can hope to keep it under control and eradicate it.

I do not propose to enter into the etiology, pathology, symptoms and treatment of trachoma. That you can get from any of the treatises on the disease. I merely wished to tell the condition of affairs in our state of Virginia in relation to this peril to eyesight, and to show that we have a danger to confront, and to devise some means of meeting it satisfactorily.

Whilst some few cases of trachoma seem to be cured, I have my doubts about the accuracy of the diagnosis, as it is so easy to confound follicular conjunctivitis with the follicular form of trachoma. The one gets well leaving no traces, the other changes the mucus membrane into cicatricial tissue, which is the so-called cure of trachoma. As the latter is essentially a chronic affection with a long chronicity, the mere fact of its cure without destroying the mucus membrane is sufficient evidence of a mistaken diagnosis. When we have discovered the cause of it, the specific germ, if there is any, we may look for a rational treatment that will arrest it. Meanwhile all we can do is to treat each case so that we can keep off the corneal complications and thus preserve some eyesight, and take such measures as will keep its spread within bounds.

TRACHOMA.*

By C. R. Dufour, Phar.D., M.D.,
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Trachoma may be defined as a disease of the eyes, chronic in character but with acute exacerbations. It is of long duration, and usually causes partial or total blindness. It is highly contagious, so for this reason, for its chronicity and the disastrous effects upon the organs of vision and the headway it seems to be making, in some localities, it should be classed as the most important disease of the eyes to claim our attention and our best efforts to eradicate it. It is of very ancient origin, and is thought to have originated in the Orient, though some charge that Napoleon's soldiers brought it to Europe when they returned from Egypt. It is very prevalent in Turkey, Russia, Greece and southern Italy. The Indians and true Americans in our own country have it to a large extent. The negro is said to be liable to it, if he is brought in contact with it. In my experience of 14 years in the eye and ear clinic of the Central Dispensary and Emergency Hospital, where 20 or more patients were seen daily, we never saw a case of trachoma in the pure African. There occasionally appeared cases simulating this disease, but it cleared up under treatment. Ninety per cent of the population of Egypt have it. It is as a rule more prevalent in those countries having extensive seaboards, from whence it spreads to the interior, so for this reason it may and does become prevalent in any country. It is found mostly in our large cities, especially those on the sea coast and where the tide of immigration has brought the persons of different nationality, for it is found most in those of foreign birth or parentage.

As I have stated, it is prevalent among our true Americans, in the mountains of eastern Kentucky, West Virginia, Virginia and southern Illinois. This infection was probably caused by some aliens coming into this country before the immigration laws were enacted, and it has spread by reason of ignorance, lack of medical attention, poverty and uncleanliness. A great many of these people suffer in silence and make no effort to get relief, because they think that everything happens for the best; that if the good Lord saw fit to send this disease to them that it was their duty to bear it and not murmur. This superstition must be overcome.

Very young persons escape this disease. The reason attributed is that the adenoid elements of the conjunctiva are not found in the very young; they do not develop until about the third year of life. This probably is the reason that the young children in a family in which the older members have trachoma do not contract it, though continually exposed to the infection. The micro-organism causing trachoma has never been isolated. In 1882 Michal and Sattler announced that they had discovered a diplococcus in the trachoma discharge which they believed to have a causative relation to trachoma, but investigations have disproved their claim. The microscopic examinations of the trachoma secretion showed the staphylococci, aureus and albus, sometimes citrous; also Kock & Weeks' bacillus, diplococcus of Morax and Axenfeld and pneumococcus of Frankel. The opinion still exists that trachoma is due to a specific organism, which eventually will be discovered.

Inflammations of the conjunctiva are caused by certain micro-organisms, and this fact is probably the reason why a chronic trachoma, which may be called quiet and causing no discomfort, becomes acute and actively contagious.

There also seems to be a condition in some eyes that renders them immune to the infection, for we see sometimes members of a

*Read in Section on Ophthalmology, Rhinology, Otology, and Laryngology, Southern Medical Association, Eighth Annual Meeting, Richmond, Va., November 9-12, 1914.

family with trachoma and others of the same family without it, so it seems there must be a resistant and a non-resistant condition of the tissues of the eyes. It is well known that this disease is found among those who ignore the laws of hygiene, who use the towel and other toilet accessories in common, make no effort to keep themselves clean and prevent infection to others.

In the early stage of trachoma there occurs quantities of lymph cells which raise up the conjunctiva and form small elevations which can be seen by everting the upper eyelid. These after a while undergo organization and connective tissue is the result, which subsequently contracts and causes the sequellae of this disease, which is followed by partial or total blindness. In some cases the disease may be so severe as to seriously affect vision from the beginning. The cornea may be infiltrated with purulent matter, there may be hypopion and perforation, with loss of eye. The other complications which I will only mention, as they are so well known, are pannus, and cicatricial contraction. Ectropion by causing constant irritation causes a keratitis, which may be followed by softening and ulceration of the cornea, and may result in partial or total corneal opacity staphyloma or perforation and panophthalmitis. Even should the after effect of this disease be not so serious, yet the slight haziness of the cornea that results reduces vision very much and lessens the earning capacity of the idividual. The progress towards cicatrization is not always uniform; exacerbations and remissions occur, and an intercurrent conjunctivitis may nullify all our previous efforts to cure. Typical cases of trachoma are easily diagnosed. The granular thickened and infiltrated condition of the conjunctiva are not liable to be mistaken for any other disease. Some of the acute cases as well as vernal catarrh have been mistaken for trachoma. Parinaud's conjunctivitis, though rare, has also been mistaken for it. A thorough knowledge of these diseases will prevent such a mistake being made.

A very important phase of this disease is when we have to decide if it is cured and no longer liable to infect others. In my judgment if the conjunctiva is smooth and there are no localized areas of granulations or plaques of lymphoid infiltration, it may be regarded as cured. In cases where there is cicatricial tissue, but which still has areas of granulations unconverted into cicatricial tissue, although the condition is not acute, must be considered as still liable to transmit the disease, and dealt with accordingly. The prognosis of this disease is always grave. The change in the corneal curvature, the obscuration of its surface, the irregular astigmia which results from the softening and macerating effect of the trachoma, all cause a grave prognosis to be made. Just in proportion as to the severity of the disease is the gravity of the prognosis. In mild attacks a cure may be effected. In severe ones the result is not always so satisfactory. The longer the duration of the disease the more difficult is it to cure, and the less likelihood there is of such a cure being effected without having some permanent visual defect.

It is claimed that about 75 per cent of the untreated cases of trachoma result in blindness. Therefore such a dangerous disease must be treated continuously and kept under supervision until well or reaches that stage where there is no longer any danger of infection to others.

I shall only say a few words about the treatment, as it is familiar to you all. In the acute condition the patient should be placed in moderately dark room, whenever possible. Cold applications applied to the eyes every few hours. Some one of the albuminates of silver in solution should be put in the eyes, and the eyes kept clean by boric acid irrigations. If after the subsidence of the acute inflammation, the trachoma granules should either be expressed by the roller forceps or by grattage, or whatever means the physician prefers. I think the force should be sufficient only to rupture the follicles and cause moderate

hemorrhage. The reaction is treated by cold applications and antiseptic solutions, mild in character. Any granulation areas may be touched with sulph. copper or 25 sol. argyrol rubbed into the tissue. Some prefer the bichloride of mercury solution, one to five hundred. Corneal complications are treated as they arise, ulceration by means of sol. atropine and cauterization, if the latter is found necessary, and hot applications. The health of the patient must be looked after, and very important, he must be put in hygienic surroundings, fresh air and nutritious diet.

These cases should be treated where hospital accommodations are at hand, where they will be under the constant supervision of the physician and nurse. They should be kept in the hospital, as far as practicable, and in wards by themselves, with nurses who will look after them exclusively. Individual basins, towels should be supplied. Gauze or paper napkins should be used only once, then thrown into some receptacle where they can be destroyed. Nurses should be careful of their own eyes, should wear goggles, thoroughly disinfect their hands after treating each patient and at the end of all treatments.

Trachoma should be a reportable disease, and laws should be enacted requiring those having it to accept treatment. Vaccination is compulsory in most communities, so should the treatment of trachoma be compulsory. This problem is one for the state and the U. S. Government to take in hand and follow it to a finish. The government is doing good work along these lines, but more hospitals, more physicians and nurses are needed, and more money. Some, if not all, of the states have not the money needed to carry on this important work. Until a thorough systematic campaign is carried into effect this disease will continue to spread, and each year many valuable eyes will be lost. The immigration law is helping very much, as it prevents any one having this disease from gaining admission into this country.

The schools must be inspected, the eyes of the children examined. Any cases simulating trachoma should be examined by an expert.

It is time that the physicians of this association should unite in one great effort to increase the ways and means to eradicate this disease and continue the crusade until not a case of trachoma can be found within our confines. Our legislators need to be educated as to the fearful effects upon the eyes of this scourge, and the urgent need of funds to carry on the campaign to eradicate it.

The earning capacity of the person having trachoma decreases on account of the impairment of his vision. He therefore has to lower his standard of living. Those who are dependent upon him suffer in consequence. If he is compelled to live in smaller and less hygienic quarters, the danger of infection then increases.

In conclusion I will emphasize that we must not cease our efforts until we have eradicated this disease, which we can only do by our own efforts and the aid of the government and states. Then we must be on the alert not to allow it to begin again. In the communities where it does not exist, where no foci of infection has been started, and where to exist it must be imported, great efforts must be made to protect themselves from it by inspection and by legislation.

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DISCUSSION.

Papers of Drs. White and Defour.

Dr. J. A. Stucky, Lexington, Ky.—In the first place, I cannot tell you much about trachoma in five minutes as I see it in Kentucky. In the second place, I know very little about trachoma. The more I see of it the less I know about it. The reproach to opthalmology today is that we do not know the specific cause of the disease.

If I were to tell you one-half of the truth of what I find in the mountains of Kentucky it would sound more like fiction than the truth. These people who have this disease are genuine Americans. They are real Anglo-Saxons. They are not the immigrant sweepings of Europe. Second, they will never be relieved or have health unless you carry it to them. They are crowded back by civilization and locked in by the mountains. They are a stoic, peculiar people. They believe that this disease is a dispensation of

Providence; that if God gave them eyes he gave them the disease and therefore they must bear it, and they do bear it.

Dr. White showed you a picture there of two people, the blind leading the blind. I have seen eleven coming to one of my clinics on the mountainside, nine of whom had light perception, one had photophobia and a pannus that prevented her from facing the light, and the one that was leading them was a child seven years of age. Now, you can read sacred history and read other thrilling stories of such conditions, but you can go to the mountains of West Virginia and the mountains of Kentucky and find the real thing that will discount any stories that any missionaries from any foreign lands will tell, except that these people do not bow down to idols.

I do not put down as a diagnosis of trachoma any of the cases that I meet with in the mountains except those in the second stage. I meet with cases that look like phlyctenular conjunctivitis. I meet with cases that are diagnosed in Richmond or in Lexington as subacute or vernal conjunctivitis. But I do not know what it is in the mountains. If it gets well in a few days' treatment it is not trachoma. If it does get well it is something else.

I believe that the railroads are carrying the disease to the interior of our states, because it is a fact that trachoma is increasing in the Bluegrass region, and it is rapidly increasing since that first railroad entered the heart of the mountains of Eastern Kentucky. My first clinic was held forty-five miles from the railroad, and now the railroad is within twenty miles of that place, and I have gone to another place forty-five miles distant. When my first report was made I had only seen seven or eight hundred people. Thirty per cent of them had trachoma, and only those came to my clinic who were incapacitated for work and I have gotten on my mule and ridden out to see cases and found women and children (and the woman is still man's slave there; she has not risen any higher than the women in India; she not only bears the heavier burdens of the race, but she is bearing the burden in the heat of the day), one woman and three children with their sunbonnets on feeling their way made by the plow furrow on the side of the mountain, planting corn, and yet they were not suffering enough to come to the clinic.

The government has established trachoma hospitals that do not treat any disease but trachoma, and I do not believe the government can make a success of treating the trachoma if they neglect other conditions. The bodily resistance is lowered in all these people. They are underfed and insufficiently clothed. A room this size (14x15 feet) in the mountains would be a palace and would house a family of seventeen or eighteen, and in the mountains a family with less than nine or ten children is a small family. I have been in families of fourteen or fifteen children. The average mountain home has no windows. These people stopped at the sixteenth century and have not moved a peg since.

Now, then, the government must have authority to treat other diseases. I believe that trachoma is not only a reportable disease, but it is a hospital disease, and when it is brought to my clinic I treat it with the same activity that I do gonorrheal ophthalmia. There is something doing night and day, and I get results. I arrest the disease. If chronic cicatricial trachoma is ever cured I do not know it. The disease burns itself out and leaves a smooth scar tissue, often with an opaque cornea, a pannus or something else. We can arrest or relieve pannus, but there is one peculiar thing about the disease . A patient is often led in blind, who has not seen for ten or fifteen or twenty years as a result of perforating ulcer of the cornea and you see where the iris has grown into the scar tissue of the cornea. Provided there is a little clear spot of cornea you can make an incision for an iridectomy and be able to get a piece of iris no larger than a pinhead, but, strange to say, by keeping your atropia and deorine for several weeks in three out of four cases, in three or four months, the cornea will clear up a little more, the opening in the iris will enlarge and the patient who was blind from nine to twenty-five or thirty years will be able to get about and make a living.

It is the general practitioner that we have got to deal with. I know a member of the Board of Health in one of the counties of Kentucky who has trachoma. I said to him, "Doctor, you ought to be treated. Come over to the clinic or to my hospital." "Why," he says, "I've had it for twenty years."

Is it an easily infectious disease? I do not believe it is. That it is a communicable disease I do believe; indeed, I know it. But I believe that the body resistance has got to be lowered and then the disease must be rubbed in. I do not see any other way that we can account for it.

Another strange thing about it is that we find it just as frequently in the lower lids as the upper. As I have said in previous papers, I often find one eye with a well-marked chronic trachoma, with the sequelae, and the other eye perfectly well. Something has occurred to make it immune.

I do not like to treat trachoma. It was my scientific curiosity that got me into this trouble, and I have never been able to get out of it. The cases have continued coming to me for the last twenty-five or thirty years in increasing numbers every year. A mother and two or three children would come and stay a day or two at Lexington and I would give them some drops, and they would go home and come back in six or eight months. The mother had one eye blinded and the children were worse. Where did they come from? I did not know, so I determined to find out. I rode on the railroad for eighty miles and then got on a mule and rode across the mountains ten miles, and I had not gone the ten miles before my curiosity was satisfied.

I wish I had something new to suggest to you, but as oculists you know if there are adhesions give the eye more room. If you have a pannus, you know what to do with that. But the principal treatment of trachoma is primarily surgical, and then after that the treatment is both systemic and local. I regret very much, Mr. Chairman, that I haven't something new to offer you, but I haven't.

I wish this section would go on record as requesting the United States Public Health Service to grant their surgeons the privilege of doing something else besides treating just the eyelids. Hundreds of these cases need adenoid and tonsil operations. In my clinics I average sixteen ether operations a day, and then all of the operations under local anesthesia that I can throw in from sun-up to sun-down. Nearly all of them have hookworm. Nearly all of them need dentists. But the chief thing needed is a campaign of education, and the whole problem is to be solved by three people—the medical man, the graduate trained nurse (the womanly woman who has the instinct and tact of a woman, who can go into these homes and teach them) and the school teacher. I can ride for hours in the mountains, ride for a whole day, and all the schoolhouses that I pass in one whole day's ride, riding fast, too, at the rate of four or five miles an hour—you could count all of the schoolhouses and churches that I pass on the fingers of one hand and then have one or two fingers left. The far-away hills look green. I don't love India's coral strand any less, but I'll be doggoned if I don't love Kentuckians and Virginians more.

Dr. Clifton M. Miller, Richmond, Va.—It is a very strange thing to call on me to discuss this question after the papers read by Dr. Dufour and Dr. White. Dr. Stucky, I suppose, must have seen more of this class of work than any other man in the South.

Dr. White has called attention to the fact of its rarity here in Richmond. I have been practicing ophthalmology here for fourteen years, and in my practice in Richmond I believe I have only seen three cases. We will wake up some morning and find it here, though, and it is going to hit us all in the head. When we start hunting for it we will find not one focus but foci scattered all over the state. We of the South have got to realize it. We have got to take precautions right now. We cannot leave this thing to the government. We cannot leave it to the state or city boards of health, we have got to take hold of it along with them. We are very properly through the South, in my opinion, now passing segregation ordinances in regard to negro residents. That is proper and right. But at the same time we are passing segregation ordinances we are not giving the negro sufficient room in his restricted district to spread out and live in even as hygienic a state as he wants to live in. Take this city today, you who visit here will go up and down our boulevards and over the squares and parks, and you will be impressed with the beautiful city. I would be ashamed to take you out in what we call "Africa" to see the conditions in which the negroes are living—our domestic servants. The railroads bring this thing everywhere; they are carrying it about; and our colored people are living under just the conditions in which this arises, and unfortunately a large per cent of the negro population of Richmond is not pure African; they are mulatto, and whereas the pure African may or may not be immune, the mulatto certainly is not, and the mulatto has the vices and weakened resistance of both races, with none of the hardy virtues of either, as a rule. And under these circumstances they are far more liable to this infectious disease. One of our clinics one of these days is going to report to the Board of Health a case of trachoma. The Board of Health is going to start a systematic hunt for it and are going to find forty cases scattered about. Then there will be a great furore. The conditions will be the same as in Kentucky. The negroes do not come down for little things. They wait until they are very bad off.

I believe it is a real menace. We have got to warn the teachers and schools. The nearest neighbors to these negroes are the storekeepers that have come here from southwest Russia, Jewish storekeepers, and if they get trachoma it is going right into the neighborhood where it is spread.

I wish I could tell you something about it. I have not seen many cases in the last few years. I saw a good many hundreds in the clinics in New York and Chicago. Those in New York were nearly all in Russian Jews. They came in the clinics in hundreds sometimes, and the Russian Jew with his trachoma may get into this country and he goes everywhere in the cities and is a constant menace to all of us in the cities.

Dr. Stucky—May I make another statement? Dr. White said it did not occur in children under three years of age. I made the same statement up to a year ago, and recently I found a case in a child twenty months of age, and I thought that was the youngest on record. One of the government experts reported a case at Newport at the last meeting of the State Medical Society of a child seventeen months old. And at my last visit, the middle of September, I found a typical case of trachoma with sequelae, with a pannus—it was not a so-called vascular keratitis from the spirochete, it was a real trachoma—in a child fifteen months old, and the youngest one I ever saw. I took a picture of it and had the child under treatment, and it has been under treatment long enough to prove that it is neither the spirochete nor the follicular variety.

Dr. Dunbar Roy, Atlanta, Ga.—I was intensely interested in Dr. Stucky's remarks, as I always am, and especially on this subject that he has been working at for some time. I would like to ask him if he finds in the work that he is continuing in the mountains of Kentucky an increase of trachoma since his own clinical work has been done, and does it seem to be coming nearer to the stations now or is it still mostly confined far inland in the mountain districts?

Dr. Stucky—The place where the first clinic was held five years ago looks like a new community, the people are all so different. And at each clinic we have a regular chautauqua series There are three lectures delivered every day. I always take four nurses with me. There are demonstrations made by the nurses in home nursing and sanitation and my assistants and myself lecture every day. The disease is steadily on the decrease in those places, but it seems to me the farther we go inland and the higher up we go the creek beds, the more of the abominable disease we have. There are no roads in the mountains where I go except the creek beds. All of the viaducts are aquaducts, and if a rain comes

up and it rains three or four hours you have got to wait till "Hell for Sartin Creek" or something like that runs down, or simply stay where you are.

The disease is on the decrease, and the people are beginning to appreciate it. At first those natives rebelled at the railroad coming through the hills. I had to be identified before they would do anything more than let me look at them. Now they are the most grateful people in the world. One family will come and bring a dozen into the clinic.

Dr. R. G. Buckner, Asheville, N. C.—I rise to discuss this question, not because I have seen so much of it, or so little of it, for in several years in Asheville I have only seen five cases. Four of them were in a family from Kentucky, temporarily living in Asheville. One was a woman, about 40, who had visited Texas and contracted the disease there. This family from Kentucky returned after two or three years' residence in Asheville. The other case was treated by me over a period of two years, six weeks daily, and then at intervals, with recovery from a vision of 5-200 to 20-40.

I say I rise to discuss this question not because I have seen so much or so little of it, but after hearing the papers and Dr. Stucky's discussion I seem to have a vision that I cannot keep. I believe that each member of this section has a duty to perform during his period of service, a duty to perform to the generations that will live in this country five hundred to a thousand years from now. One or two spoke of the work that the United States government can do along this line, just as it is in New Orleans today. Now, how are they suppressing the plague in New Orleans? Surgeon General Blue went down there and he was welcomed and told that they would appreciate his services and suggestions and so on, but that they thought they could handle the situation, but would appreciate his help. He told them that he had come there for the purpose of investigating and doing what could be done, rendering whatever help he could, and he said, "Of course, we have no authority under the Constitution and laws of the United States to do much without being asked, and we will not do it, but," he says, "if we get out of Louisiana we will be the only one who will go out." That meant that the general government would quarantine the State of Louisiana against the plague. Then they were very glad for him to take charge. And how are they working? They set out to catch all the rats in the neighborhood where these two cases first occurred. Immediately after being caught the rats were dipped in a solution that would kill all the fleas on them. The rats are all taken to the proper place and autopsies made. When a suspicious case is found deputies are sent to catch all the rats in that house if they have to destroy the house and all the rats in that community. Now, the rat is the origin of the infection. In that way they expect to stamp it out, and we expect it to be efficient. There is no quarantine against the State of Louisiana or against New Orleans.

Why can't the same thing be done against trachoma? This display of trachoma pictures reminds one of a Vienna clinic. If such a wonderful transformation has taken place in some of the communities as Dr. Stucky describes, suppose the government were to go after this trachoma scourge like they are going after the plague in New Orleans, then it could be stamped out. Then isn't it our duty by suggestion, by corresponding with the health department and urging that they stamp it out. May we not as individuals render a service to the generations that will live a thousand years from now, when on account of the impaired ability of people to make a living the number will become larger and larger and the ignorance and low standards of living will make conditions in this country like they are in the Orient?

It seems to me that the Public Health Service should stamp out the disease. Dr. Foster, of the Marine Hospital Service, went all through North Carolina. I do not know how long he spent in that State, but several months, and he found less than thirty-five cases in the State. Fully half of them were in an Indian school in the mountains of one of the extreme western counties bordering on Tennessee, something like a hundred miles west of Asheville. Our State, like Virginia, is peculiarly exempt from it, except some of the border counties. This disease is biting into the adjoining areas. And it seems to me, as was suggested by the one who read the first paper, that the good that will come from this series of papers and the discussion will be most from what we do in the way of stamping it out where it exists and preventing its spread. Of course, that is being done in the large cities farther north. I noticed a few years ago that there had been about 3,100 trachoma operations in the charity clinics in New York City within about six weeks after the schools had opened some five or six years ago. There is being done a great deal of local city work in the large cities towards stamping it out, but in these outlying districts it seems to me that the general government could do a great deal in stamping it out, just as they have taken the plague situation in hand in New Orleans.

Dr. J. W. Jervey, Greenville, S. C.—I simply rise to add a crumb of comfort to those who have listened to these lugubrious addresses on trachoma. We are not at the present moment threatened with a seething cauldron of infection about to burst. We are not about to experience a cataclysm of trachoma, and I feel very much as did the famous judge of scripture who said. "What good can come out of Nazareth?" I believe that this discussion is one of the things that is good that has come out of Kentucky's "Kingdom Come," and my friend Stucky is another. I have practiced ophthalmology amongst the natives in the mountains of western South Carolina, North Carolina, and eastern Tennessee. In the course of sixteen years' experience I think I have seen not over six cases of trachoma—and I wish to insist, in the face of what my friend Stucky, White or Miller may say, that I do know a case of trachoma when I see it—and every single one of those I have seen occurred in foreigners. I do not mean to say that this disease does not exist in Kentucky; I know that it does in the mountains of

Kentucky, but I do mean to say that it is not a disease that is likely to become epidemic throughout the rest of the country. The indications point to the fact that this disease has existed in these localities for years and years, and is endemic in that portion of the country. We have had railroads penetrating these mountains for thirty or forty years. Parts of those mountains that you have been investigating, twenty years ago had no railroads; today they have. Twenty years ago they had this trachoma; the railroads did not disseminate it and the railroads are not going to disseminate it today. A government expert passed through my town about a year and a half ago. His mission was to find trachoma. He made a six weeks' journey through the mountains of East Tennessee, western North Carolina and western South Carolina, and drifted into my office. He asked me if I could point out to him any cases of tracoma. I told him that I could. He said, "Lead me to them." I put him in my car and carried him and showed him two or three cases of trachoma that I could put my hands on. He said, "But these people are foreigners." "Exactly so." "But," he said, "are there no natives in this neighborhood that have trachoma?" I said, "I haven't seen them." Then he told me that under a mission from the United States Public Health Service he had been searching for six weeks throughout the mountains of East Tennessee, western North Carolina and South Carolina. He had found about six cases, and he confided to me that he was not sure whether those cases were trachoma or follicular conjunctivitis.

Now, I am not underestimating for a moment the importance of Dr. Stucky's work. I am as ready as any man to pay tribute to it. I honor him for it, and I think he is doing a great work. I know it is a great problem, but it is a local problem, and not a problem that is threatening the civilization of the South or any other great part of the United States. Furthermore, Dr. Miller has expressed the fear that sooner or later there will be an outbreak of trachoma among the negroes. Mr. Chairman, these particular foreigners in my locality in which these cases of trachoma occurred live amongst the negroes; that is their habitat; they are Syrians, and they have a little colony; they are amongst and surrounded by negroes; and I have yet to see a case of trachoma amongst the negroes. I have never seen a case of trachoma in any one who had, so far as I knew, a particle of negro blood in his veins, and I believe that Dr. Stucky will bear that point out. So I say I do not think it is a problem which we need fear is going to foist itself on the South. It is a great local problem, and a problem that will require a great deal of hard work; but for ourselves, practicing in other parts of the South, I think we need not fear that we have run up against a juggernaut that is going to wipe us out.

Dr. Dufour (closing).—I think this subject should have come before the entire association. I would like to see this association go on record as being in favor of having a committee appointed to devise ways and means to eradicate this disease. Such a committee would have great influence with the legislators both of the general government and of the States, and would be able to secure their assistance, financially and by the furnishing of expert physicians and nurses. This crusade should be continued until this disease is thoroughly eradicated, and there is no longer any danger of contagion from any one.

I am interested in hearing Dr. Stuckey say he had seen trachoma in children under three years of age. I have never seen it in those so young. I think the cases in Washington City have decreased. Several years ago, there was more of it than there is at present. It was found in those of foreign birth, never in the negro and very young children.

My plea is for this association to formulate a campaign of education, prevention and eradication.

Dr. White (closing).—Dr. Stucky said he had seen three cases among babies. At the same time, the doctor knows he has seen hundreds of babies where every single member of the family had trachoma except the baby, and therefore we might practically say they are immune to the infection. Of course, there may be occasional exceptions.

Dr. Stucky answered Dr. Roy's question by stating that trachoma had declined considerably in the localities in which he does his work, but he failed to tell you that it is steadily spreading over the mountains into the bluegrass sections of Kentucky, and it is found almost in central Kentucky now. And how did he get his improvement in conditions—not simply by the treatment of cases, but by educating the people, by publicity and by calling attention to its dangers. That is the way he succeeded in curtailing its ravages, but in the counties where that education and that publicity have not been given you will find it just as bad as it was before.

Dr. Stucky.—A nurse is left in the field to follow them up.

Dr. White.—That brings me to a paper I read in Washington on the conservation of vision. Dr. Stucky has charge of it in Kentucky; I have charge of it in Virginia. This is one of the subjects that we have to call attention to. It is nothing but a campaign of education, a public health question, to teach people ordinary sanitary measures and proper methods of living, proper ways of avoiding the perils to eyesight, among which trachoma unquestionably is one. Dr. Jervey says that in western South Carolina there are very few cases among the people. The probability is that there is a better class of people there, more in contact with civilization, than the mountaineers of western Virginia and Kentucky. They know its danger, and if a case comes in their midst it does not spread the disease as it does among a people who know nothing about its dangers.

As for negroes having it, I have found just as Dr. Jervey has that they are not immune. Swan Burnett wrote on this subject years ago. He lived in the mountains of Tennessee among the negroes, and he never found a case, and I thought just as he thought until I saw one or two cases. They are not immune, although they are less liable to it than Caucasians, as stated in my paper.

We are going to establish trachoma clinic sta-

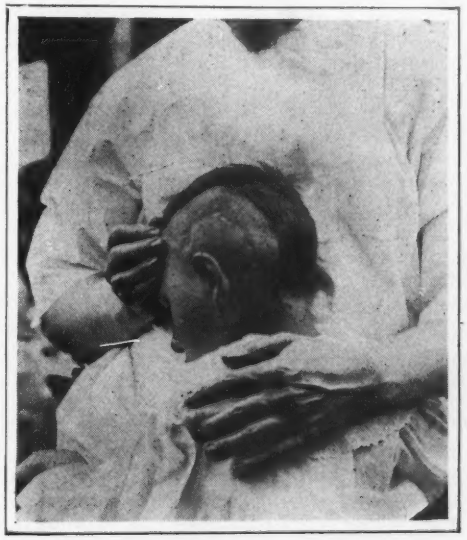
tions in the Virginia mountains, and the Public Health Service has already requested me to go to the mountains with them and give the people some instructions on this subject, so that they will know how to avoid the peril.

ACUTE PURULENT OTITIS MEDIA COMPLICATED BY MASTODITIS AND TEMPORO-SPHENOIDAL ABSCESS.*

By R. W. Bledsoe, M.D.
Covington, Ky.

On June 2, 1914, John Roach, aged 6 years, complained of headache. A swelling was noticed behind left ear; it was not painful nor was earache indicated. While no further pain was complained of, this swelling increased in size for twelve days, or until June 16, at which time it bulged outward on a line with the rim of the ear. The surface was then red and glistening and apparently ready to rupture. The child was taken to Dr. Chas. Reynolds, an aurist and oculist and a personal friend of mine, who incised the abscess and drained it of a large quantity of exceptionally foul, greenish pus. There was only a very slight discharge from the left ear. Each morning he carefully dressed the case for eight days, or until June 24th, when the child had ten convulsions during the early morning hours. Upon consulting by phone we agreed it was a case for immediate operation and advised to bring the child to St. Elizabeth's Hospital, where I saw the patient at 9:30 a. m. The child was semi-comatose, could be roused momentarily only by shouting to him. The right side of the face, the right arm and leg were paralyzed. When roused he could raise the left arm but not the right. Axillary temp. 102 3-5; pulse, 136. A three-fourths inch granulating wound was present behind the left ear over the mastoid, which discharged foul, greenish pus when pressed upon. This pressure caused much pain and roused the patient. While the right hemiplegia indicated some brain complication, we concluded to do a mastoid operation at once, and if deemed necessary expose the brain next day. The patient's condition was very bad and we considered it wise to not attempt too much surgery under the present circumstances. Ether was cautiously given by Dr. C. N. Heisel and with the assistance of Dr. Reynolds I did a simple mastoid operation. We found a small perforation into the antrum. Antrum and mastoid cells were filled with granulations and very foul, greenish pus. The cavity was thoroughly curetted in every direction, during which I exposed lateral sinus and emissary vein, but could find no perforation into the cerebral cavity. Drainage was inserted and upper portion of wound closed.

The following morning, June 25, temp. was 100, pulse 92, and all signs of right hemiplegia had disappeared. That evening the temp. was 100 1-5 and pulse 80. June 26th, temp. 99 1-5, pulse 76; dressings were saturated with foul, greenish pus. These were changed and a portion of the drainage pulled out and cut off. General condition of patient was excellent. Had rested well all night,



was cheerful, though hungry. The evening temp. was 99 2-5, pulse 76.

June 27, rested well all night; temp. 98 2-5, pulse 76. Insisted on getting up out of bed.

For next three days general condition was excellent, temperature and pulse practically normal, not the slightest indication of paresis anywhere, and only by constant amusement could the little fellow be persuaded to remain in bed.

Slept well, awaken early, ready for breakfast, sang, whistled and enjoyed every minute of the day.

On July 1st, the ninth day following the operation, I found him asleep. I was told that he had slept well all night, had enjoyed his breakfast and was just taking a nap. I did not disturb him but

*Read in Section on Ophthalmology, Rhinology, Otology and Laryngology, Southern Medical Association, Eighth Annual Meeting, Richmond, Va., November 9-12, 1914.

made my rounds and came back in an hour to find him awake but drowsy, quiet and indifferent, but no paralysis nor other untoward manifestations; temperature and pulse normal.

Thinking this slight change was of intestinal origin, I ordered magnesia citrate, which when aided by enema late in the afternoon was followed by a thorough clearing of the intestinal tract, but no improvement in the mental condition. Temp. 99 3-5, pulse 84.

July 2nd, slept well all night, refused breakfast for the first time; was very drowsy, could be roused but would promptly lapse into deep slumber; temp. normal, pulse 64. At 6 p. m. patient was comatose; could not be roused at all; temp. normal, pulse 56; no paralysis, no inequality of pupils.

Dr. Robt. Ingram, neurologist, saw the case with us and we agreed on the probability of temporo sphenoidal abscess and operated early next morning.

July 3rd, 7 a. m., patient was apparently once more in extremis. Ether was cautiously administered by Dr. C. N. Heisel.

In the presence of Dr. Robt. Ingram, Dr. Jno. W. Murphy and Dr. Chas. Reynolds I made large curved incision above left ear. Periosteum was elevated and flap turned down over the ear. Trephined above auditory canal. Upon removal of the button of bone the dura bulged through the opening, but no pulsation of the brain was present. The trephine opening was enlarged, dura incised crucially, through which brain protruded. Probe was inserted into the temporo-sphenoidal lobe of brain toward the base and only after penetrating two and one-half inches was abscess entered, which was immediately followed by a sudden and powerful expulsion of greenish, foul pus. Closed hemostat was inserted and withdrawn open to evacuate abscess, after which pulsation of brain was seen.

The trephine opening was then enlarged downward and backward to connect with mastoid wound, which was opened and refreshed. Narrow strip of gauze drainage was inserted into brain abscess cavity and the outer end brought out through mastoid wound. The dura was closed with suture except at lower part, through which gauze passed. The skin flap was brought up and closed tight. Usual mastoid dressing was applied, patient given strychnia and saline under the breast and returned to bed, where hot water bottles were applied.

That evening temp. was 99 1-5, pulse 66. While stupid, drowsy and irritable, patient could be roused easily.

July 4th, a. m., temp. 99 1-5, pulse 68; mentally much clearer.

July 4th, p. m., temp. 98 2-5, pulse 68.

July 5th, a. m., temp. 98 2-5, pulse 72; general condition markedly improved.

July 5th, p. m., temp. 99 3-5, pulse 88.

July 6th, 7th, 8th, 9th, and 10th, temp. 98, while pulse varied from 68 to 114. Each day a couple of inches of gauze packing was removed.

Wound discharged freely and hernia cerebri present.

July 11th, evening temp. 99 3-5, pulse 100.

July 12th, temp. went to 99 4-5, pulse 114, after which temp. returned to normal.

The patient left the hospital on August 1st perfectly well mentally and physically, the hernia cerebri having completely disappeared.

I wish to pass around some stereoscopic photographs of the case, taken about the middle of August.

My reason for reporting this case is not only because of the complete recovery of the patient, but also on account of the complete disappearance of symptoms of pressure in brain for nine days following the mastoid operation, at which time pressure symptoms reasserted themselves, producing profound coma.

AUTHORS' ABSTRACTS.

Eye, Ear, Nose and Throat.

Total Rhinoplasty—A Case Report. By Richard Johnson, Baltimore, Md. American Journal of Surgery, April 1915, pp. 149-151.

The patient, a man, 25 years old, had his face cut to pieces by a circular saw. His left cheek hung in shreds, his chin was cut completely off to the mental process, his upper lip was cut upward so that after healing it formed a hare-lip, and his nose was shaved off even with the face on the left, while on the right a small stump remained.

I removed a piece of cartilage from the eighth rib and shaved it down to 3 mm. in thickness. After notching the cartilage three-quarters of an inch from one end, I planted it under the periosteum in the center of the forehead, where it remained two months until it was firmly attached to that membrane. To form a foundation for the upper part of the nose I dissected as much skin as possible from the remains of the nose and turned the flaps over, with the skin surface down, and stitched them in the middle line with raw surface up. The flap from the forehead was brought down and stitched to the sides where the flaps had been dissected up. The cartilage was sewed above and bent at the notch below so that it could be anchored in the upper lip. The nose flap was split in the middle up to the insertion of the cartilage, and the sides turned up on each side and held in place by rubber tubes to form the nostrils. Raw surfaces were thus in apposition in every part of the nose. Healing was uneventful.

The Southern Medical Journal

JOURNAL OF THE
SOUTHERN MEDICAL ASSOCIATION

Incorporating Gulf States Journal of Medicine and Surgery and Mobile Medical and Surgical Journal.

Published monthly at Nashville and Birmingham. Price. $3.00 per year; 25 cents per single number.
Address Southern Medical Journal, Suite 807-8 Empire Bldg., Birmingham, Ala.
Entered as Second Class Matter July 8, 1908, at the Postoffice, Nashville, Tenn.

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Next Meeting, Dallas, Texas, Nov. 8, 9, 10, 11, 1915

EDITORIAL DEPARTMENT

HOW ARE YOU, DOCTOR?

How is your own particular human machine getting along? Are you taking as good care of it as you are of your watch or your auto? Are you careful that the delicate mechanism (and you know how wonderfully delicate it really is) gets the right lubrication, the carbureter has none but pure hydrocarbons as fuel? What would you think of a mechanician, skilled and expert, who left his machine exposed to all kinds of weather, used any old sort of lubrication, bought impure gasoline and ran with tires half inflated, and then when the machine broke down or stalled condemned it as "of no account?" Here is another illustration:

The life insurance companies selected 100 busy men from the "preferred" class, bankers, preachers, merchants and the like, of an average age of 30 years, and had them examined by skilled experts provided with everything that could aid in reaching correct conclusions. There were not ten in that 100 who thought there was anything wrong with them, yet here are the results. Normal, 3. Minor ailments, preventable stage, 38. Moderately affected, curable or deferable stage, 51. Seriously affected, 8.

All these were supposedly well people, but fifty-nine needed medical attention, and were sent to their doctors for treatment. Their troubles were those of degeneration, such as results from old age or long-continued overwork, just such forms of degeneration as you need to apprehend in your own human machine, doctor. Of all the men whose brain and hands are constantly employed for gain or duty, none must sustain a harder strain upon brain and nerves than the conscientious physician. Sometimes the burden of his responsibilities seems greater than he can bear. It robs him of sleep and appetite and whitens his hair too soon. These things are evident, but who can see the havoc wrought on kidney tis-

sue and blood vessels by constant overwork? When at last the inevitable breakdown comes it leaves him partly crippled in some important function, if it leaves him alive. Every doctor owes it to himself, to his work and to his friends and dependents to care for his health methodically. Not less than once every year he should submit to a thorough physical examination by some skillful and competent diagnostician and accept and be guided by his conclusions. Do as you would have others do, doctor. Be guided by the same knowledge and wisdom in handling your own condition that has made you a successful physician.

Then you will not shrink from having to answer the question, "How Are You, Doctor?"

THE ROAD TO RACIAL IMPROVEMENT.

Ephemeral literature has been crowded with arguments and schemes for the production of more perfect men and women. Some urge the sterilization of the unfit, others would prohibit the marriage of any who cannot show a negative Wassermann, while still others would allow marriage only to those who can pass a medical examination as severe as that of the most exacting life insurance company.

Meanwhile, aside from and unmindful of the unhealthful discussions and impractical propsals of the faddists, there is a movement that is gaining strength and purpose every day, that having once started will never cease to grow until it reaches its consummation in the highest perfection possible to humanity, a perfection towards which we are blindly struggling unconscious of its magnificent promise. That movement is the world-wide fight for sanitation and public health, the growth, the magnitude and the scope of which are not generally realized, and whose ultimate inevitable effect upon the human race is beyond the realms of the most extravagant dream. The movement is a revolution in social life, a revolution that will never go backward and will never cease. Years will not measure it, for, like the life principle, it is immortal. In the far distant but certain future one of the certain fruits that it must bear will be a healthy humanity with perfect offspring. As the eons of time have, by invisible degrees, advanced humanity from the stage of the cave dweller to the weigher of the stars, so must our further development continue, and the swiftest agency therein will be this grand, irresistible movement that aims at the eradication of pathological germs by the growth of universal cleanliness, which is universal sanitation. This, and this alone, is the true road to racial improvement.

STATE EXAMINATION OF SCHOOL CHILDREN.

The legislature of Florida has passed a bill providing for the examination of school children and school buildings and their surroundings, including the rural schools. It is to be conducted under the direction of the State Board of Health.

The bill was drawn up by one of the most active health officials in the State, Dr. Oliver J. Miller, City Health Officer of Sanford; was introduced into the House of Representatives by Hon. Forest Lake, of Sanford; and handled in the Senate by State Senator Arthur E. Donegan, of Kissimmee. The success of this effort of the City Health Officer of Sanford is a boon also to every other city and county in the State of Florida, and the influence of its example and its inevitably beneficient results will spread in every direction. For the sake of their own honor and the welfare of their children other states should take similar action.

The debt a commonwealth owes to its children is the most sacred of all its obligations. Unable to resist neglect or abuse, they rest helplessly subject to the will of the grown-ups who feed, clothe and educate them. If while in obedience to law and custom they are attending school their health is injured or

imperilled by insanitary surroundings the blame for the lamentable results lies on the heads of those in authority who provide the buildings and surroundings. If the children are handicapped by some infirmity, probably unsuspected, it is the duty of the State to so look after them that their weak points may be discovered and, if possible, remedied.

All this is within the bounds of possible accomplishment, and at a cost so small in comparison with the value of even one of our future citizens rescued from disablement that no humane or patriotic man should oppose the enactment of laws to effect it.

Dr. Miller and the men and women who assisted him in securing the passage of the law have earned the approval of this generation and the gratitude of generations to follow, for such revolutions endure the test of time.

WOMEN IN MEDICINE.

In 1904 there were 1,129 women students in the medical colleges of the country, the largest number on record. In 1912 there were 679. In 1913 there were 631. Only 3.4 per cent of all graduates in medicine last year were women.

Twenty years ago there was an apparently well-founded opinion that women were going extensively into the profession of medicine. The field was broad and there was and still is a place for them. They have always met with a cordial reception when they visited medical associations and have been encouraged in the work.

Nevertheless there has been a continual decline in the number of women studying medicine. This cannot be for any lack of success on the part of women graduates. On the contrary almost without exception they are doing fairly well in the practice of medicine and in many instances have achieved distinction. It is not impossible that the increased number of years demanded by the curriculum, and the expansion of the demands of pharmacology and dispensary work may have a repellant effect upon young women when they investigate the requirements of a modern medical education, and discourage them from undertaking the gigantic task. Moreover, the five years that must elapse before she could lawfully undertake to practice must look like a long period to a girl of twenty-one just graduated from a college of sufficiently high rank to be recognized by the medical departments of first class universities. This condition of affairs is to be regretted. There is a place in the practice of medicine which gentle, competent woman can fill very acceptably.

There will never be enough women in the profession until in every city and town any woman who desires a physician of her own sex who is competent and agreeable can have her wish gratified without difficulty. At present such is far from being the case.

A SPLENDID EXAMPLE.

At Dallas, Texas, on July 8, 1915, a noble woman passed from this life, but left behind her not only an honorable memory but also a deathless reminder of her broad-minded interest in human welfare. Her name was Mrs. Cammie R. Howard. She was the daughter of a physician, Dr. Dickson Thompson, and the mother of another member of the medical profession, Dr. M. M. Carrick. She was largely instrumental in the establishment of the State Tuberculosis Sanitarium and the founding of the Woodlawn Hospital for Tuberculosis at Dallas. Her son, Dr. Carrick, is authority for the statement that her will provides $25,000 for this city-county institution.

The JOURNAL is glad to add its mite of honor and praise to the memory of this noble woman, whose faith in the chosen profession of her father and her son enabled her to so efficiently aid its altruistic work and provide for its continuance. Mrs. Howard had the good fortune to find guidance in the judgment of her son for the best manner of carrying out her philanthropic desires, and hun-

dreds of unfortunates will find cause to bless him for his suggestions to his philanthropic mother. And this incident suggests the fact that all over the South there are altruistic men and women who would be glad to bequeath to worthy hospitals and schools of medicine some of the wealth they cannot carry with them.

Many such would, at the suggestion of their trusted physicians, insure the honorable perpetuation of their names by founding a ward in some hospital or a chair in some medical college. Where a doctor thinks he sees such an opportunity, does he not owe it to humanity and his profession to lay the matter before the possible donor for consideration?

He would be asking nothing for himself. On the contrary, he would be conferring a favor.

A CRUEL AND UNWARRANTED PRESUMPTION.

The Jackson, Miss., *Daily News* in a recent editorial attacks the belief in the existence of hydrophobia and scoffs at the established treatment thereof. The ground of this unbelife is the fact that in past days medical men have declared that in their opinion there was no such specific disease; that the awful sufferings and death that characterize it were due to fear or hysteria, and not to disease; and that it was a psychosis and not a condition. In other words, the disease was imaginary. Such revolts against common sense and overwhelming evidence are not uncommon either in the medical profession or among the laity. Witness the fanatical opposition to vaccination against smallpox and typhoid. Even the existence of a Creator is doubted by many men who are probably as eminent as the authorities cited by the learned editor. But visible facts are tough propositions in an argument and the causative germ of hydrophobia has been discovered and is now well kno and easily recognized by every senior medical student. Its preferred point of attack, the central nerve cells, may account for the fearful symptoms.

These germs can only originate from similar germs in another rabid animal and will reproduce the disease whenever inoculated into the tissues of a fresh living subject. To explain the advent of the wild, ferocious delirium, the insane impulse to attack and the agonizing death seen in horses, cows or dogs that have been bitten, on the ground of fear or imagination. is absurd. Now when a layman knows that in any medical question the medical profession itself is divided, it is not his place to settle the dispute. If he is a sensible man he must know that under the circumstances there is at least a possibility that his own views are mistaken and therefore the greater his influence may be over his fellow citizens the greater should be his care not to endeavor to control their judgment in what may become for them literally a life and death matter. In the case where such a man is an editor of an influential newspaper it is little less than cruel and unwarranted presumption to use the mighty power entrusted to him to so direct the minds of his followers that it may possibly result in bringing to some of them an agonizing death. The cheerful unconcern with which sometimes an editor will undertake to direct public opinion concerning matters of vital importance of which he himself is totally ignorant is a spectacle to make the angels weep.

A NOVEL PROPOSITION.

For whose benefit do county and municipal authorities go to the trouble and expense of quarantining and fumigating against smallpox? Answer: For the protection of the unvaccinated. They only are in danger of infection.

Why should there exist any unvaccinated person in any community when the simple procedure of vaccination is so inexpensive and is even done gratuitously by the powers that be when requested? Answer: Either because of pure carelessness or silly unbelief.

What, then, is the duty of the vaccinated public? Dr. S. L. Jepson, of Wheeling, W. Va., Secretary of the State Board of Health, suggests that those who are opposed to vaccination should not be compelled to submit to it and neither should the vaccinated public be put to the expense of protecting them with quarantine and fumigation of infected houses. If they will not accept the certain protection by vaccination offered them by the authorities, he sees no reason why those authorities should take any further trouble on their account. They pretend to disbelieve in vaccination; let them test the matter to their own satisfaction. "Placard infected houses and leave them open," says Dr. Jepson. "Then the disease will spread and those who now refuse to be vaccinated will soon come to terms." And, he might have added, none but the unvaccinated would be in the slightest danger of contracting the disease. As the logicians say, the point is well taken.

THE NEW EDITOR OF THE MARYLAND BULLETIN.

Dr. W. Edward Magruder, widely known as Medical Director of the National Investigation Bureau, has assumed the editorship of *The Bulletin* of the Medical and Chirurgical Faculty of Maryland, succeeding Dr. H. O. Reik, whose personal interests have obliged him to resign the position which he so successfully occupied for four years.

Dr. Magruder is well qualified for the new work, having a wide acquaintance and wielding a ready pen. The new editor is soliciting the co-operation of his readers by requesting their opinions upon several specified points in the proposed policy and make-up of the *Bulletin*. They are fully stated in the June number of the *Bulletin*. This JOURNAL is assured that in assuming the editorship of the *Bulletin* Dr. Magruder will not in any way diminish his attention to the affairs of the National Investigation Bureau, which will continue its efforts to amicably adjust the differences arising between accident and health insurance companies and their policy-holders. Though it would be a difficult task for any successor of Dr. Reik to maintain his standards of efficiency, yet it is believed that the selection of Dr. Magruder for the position was a fortunate circumstance, and that he will not be found wanting in the emergency.

SOUTHERN MEDICAL NEWS

ALABAMA.

The Madison County Medical Society, at Huntsville, has approved a plan whereby the city and county can jointly employ a health officer who shall devote all his time to the work.

At Birmingham the Medical Society has memorialized the city commission not to make any change in the present system of disposing of the garbage. They oppose decreasing its efficiency.

On July 28th the committee of the house of the legislature approved a bill creating "The Alabama Tuberculosis Commission." It is to be composed of eight members, appointed by the governor, and is to co-operate with the State Health Officer.

Deaths.

Dr. William T. Hamilton, a native of Mobile, and for many years connected with the U. S. P. H. Service, died at the Touro Infirmary, in New Orleans, aged 66 years.

On June 24th, Dr. Charles Wesley Adkins died at his home in Scottsboro.

On June 23d, Dr. James C. McDade, of Cecil, died at Montgomery, aged 68 years.

On June 16th, Dr. Paul C. Gaston died at his home in New Decatur from cancer of the rectum. His age was 67 years.

On July 4th, Dr. Edward C. Pearson died at the Alabama Soldiers' Home, Mountain Creek, aged 70 years.

ARKANSAS.

At Stuttgart Dr. Von Ezdorf and his assistants have been experimenting with means to destroy the larvae of mosquitoes in the rice fields. "The trouble thus far in treating the water has been the danger to the crop." He recommends general screening as a partial protection of homes.

Dr. C. W. Garrison, State Health Officer, has been investigating conditions at Lake Village, where it was said there were 20 cases of typhoid fever. Dr. Garrison speaks enthusiastically of the records kept by Dr. Henry Thibault for 16 years. They show that families who use screens

have reduced their medical bills three-fourths.

Two cases of pellagra were reported from Pine Bluff in July.

At Jonesboro the members of the Board of Health undertake to visit every school in the county during the year and lecture on appropriate subjects.

In Randolph County, July 30th was observed by all the public schools as Health Day. Pupils and parents received instruction in sanitation.

The Little Rock Gazette of July 7th published a report that there were 60 cases of pellagra in Franklin County, in and around Altus and Denning.

Deaths.

At Little Rock, July 20th, Dr. John B. Bond died, aged 78 years.

At Fort Smith, June 12th, Dr. Robert S. Austin died at the home of his daughter, aged 54 years.

At Monette, July 12th, Dr. J. C. Moore died of congestion.

DISTRICT OF COLUMBIA.

At the annual meeting of the Fairfax County Medical Society, held at the Hotel Rammel August 5th, the following officers were elected: Dr. Llewellyn Powell, President; Dr. Franklin Dodd, First Vice-President; Dr. D. E. Cline, Second Vice-President; Dr. T. C. Quick, Secretary; Dr. W. P. Caton, Corresponding Secretary; Dr. E. S. Detwiler, Treasurer. A banquet followed the meeting.

Announcement has been made of the appointment of a board of officers of the medical corps to meet at the Army Medical School, 721 Thirteenth Street, Northwest, to determine the results of the preliminary examinations of candidates for admission to the medical corps. The board is composed of Col. Charles Richard, Lieut. Cols. James D. Glennan and Champe C. McCulloch, Jr.; Majors William J. L. Lyster, Eugene R. Whitmore and Reuben B. Miller and Capt. Mathew A. Reasoner.

Lieut. Col. Champe C. McCulloch, Jr., of the medical corps, has been relieved from duty as professor of military and tropical medicine at the Army Medical School, this city, and is designated as curator of the Army Medical Museum, in this city, relieving Maj. Eugene R. Whitmore, Medical Corps, of that duty. Maj. Whitmore is ordered to report to the commandant of the Army Medical School for duty as professor of military and tropical medicine.

Deaths.

In Washington, July 12th, Dr. Oliver D. Darrell died suddenly at his home 1416 Chapin St., N. W.

FLORIDA.

At Tampa the county commissioners appointed four doctors to make examinations of the school children in Hillsboro County. They are Dr. W. C. Douglas, Dr. J. C. Knight, Dr. W. M. Rowlett and Dr. Rollin A. Jefferson. The law states that one doctor shall be appointed for every 2,500 children in the county.

Deaths.

On June 21, Dr. Wm. H. Gregg died at St. Cloud, age 85 years.

GEORGIA.

The legislature has appropriated $50,000 for the Medical College at Augusta. Much credit is given to Dr. Beall for securing the appropriation.

The Atlanta Anti-Tuberculosis and Visiting Nurses' Association has arranged to give the colored people of the city an opportunity to witness the motion picture exhibition and lectures being held under its direction for the purpose of education in hygiene and the prevention of tuberculosis. The series was presented at the corner of Houston and Piedmont Avenue. Two well known negro physicians, Drs. Slater and Butler participated in the work.

Deaths.

At Savannah, August 6th, Dr. Arthur A. Morrison died at his home, No. 1702 Bull St., after an illness of several weeks.

On July 6th, Dr. August F. Kerstan died at his home in Atlanta, aged 77 years.

On June 30th, Dr. John A. Johnson died at his home in Atlanta, aged 79 years.

KENTUCKY.

In Bell County the health survey has developed 61 cases of trachoma among school children in less than one-third of the school. The survey also has developed 25 cases of tuberculosis and 30 cases of pellagra among the school children.

At Louisville, August 3rd, the Fiscal Court appropriated $500 to be used in preparing a health exhibit at the state fair in September. The exhibit will be under the personal supervision of Dr. J. I. Whittenberg, County Health Officer of Jefferson County. Dr. Whittenberg is also authorized to employ a man to spread oil on all the ponds in the county. The oil was purchased by the county in August.

Deaths.

At Lexington, July 30th, Dr. L. L. Thornbury died as the result of a pistol shot.

At Glasgow, July 10th, Dr. Joseph S. Leech, mayor, died suddenly at his home, aged 57 years.

LOUISIANA.

The State Board of Health has decided to erect hospitals for pellagra cases. The first will be at Bogalusa. The Great Southern Lumber Company has offered to erect, equip and operate a hospital of 30 beds, and its physician, Dr. H. C. Cole, will conduct the pellagra work. Advanced cases will not be admitted. In the meantime a commission under the leadership of Dr. W. H. Seeman, state bacteriologist, will be formed to continue the study of the disease and its communicability.

The wholesale druggists of the state have requested Dr. Dowling to postpone until November 18th the enforcement of the regulation requiring that all patent medicines display their formulas.

In New Orleans, August 8th, twenty-one alleged users of narcotics were arrested in a spectacular raid in the Maison Blanche Building, and Dr. Robert H. Chilton was taken with them to police headquarters and interrogated. The doctor claimed to have a Federal permit and to be treating the prisoners for the habit.

(Continued on page xxiv.)

NILES'

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(Continued from page 830)

In Baton Rouge, July 29th, seventeen cases of pellagra were found by City Health Officer Jones.

Dr. Oscar Dowling, State Health Officer, accepts unconditionally the theory of Dr. Joseph Golberger advocating the dietary origin of pellagra. He also believes that the disease is not communicable.

In Sabine Parish the police jury has appropriated $500 to fight pellagra.

At Shreveport Dr. G. C. Chandler, City Health Officer, has issued a bulletin on pellagra in which he adopts the Thompson-McFaddin Commission's theory that pellagra is communicable, and warns the citizens to screen their homes, avoid pellagrins and houses that have been occupied by them, and use no food that has been prepared or handled by them. He also urges that the entire city should be sewered as soon as possible.

The State Board of Health has purchased 623 acres of land near Alexandria for the care of tuberculosis patients.

At New Orleans an aged physician named Hincks, living on North Rampart Street, is charged with maintaining several small offices down town where he has been writing cocaine and morphine prescriptions at fifty cents each. He was released on $3,000 bond.

Dr. B. F. Gallant, the new First Assistant Superintendent of the New Orleans Charity Hospital, reported for duty July 23rd.

At New Orleans a negro named J. B. Page, posing to the superstitious as "The Wonderful Doctor," was arrested for practicing without a license. He made his diagnoses by having the patient cut a pack of cards, the upturned card revealing the nature of the patient's disease. His only prescription was Epsom salts.

At Bastrop, July 10th, Dr. Oscar Dowling began a tour of the parish in company with Dr. J. F. Watson, Parish Health Officer, to investigate the alarming condition of pellagra.

Deaths.

At Hammond, July 15th, Dr. M. E. Dawson, of Loranger, was drowned in the Tangipahoa River, being thrown from his horse into a deep place

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MARYLAND.

On July 24th, Dr. J. McPherson Scott, Secretary of the State Board of Medical Examiners, published the names of those who passed the examination held in Baltimore June 15th. Licenses were issued to 78 new doctors.

At Baltimore, July 28th, four physicians, charged with failure to report births to the City Health Department, were arraigned before Justice Golden.

Deaths.

On July 27th, in Baltimore, Dr. Frederick D. Caruthers died at his home, aged 45 years.

At Baltimore, July 22nd, Dr. Albert J. Laciar died at his home from pneumonia, aged 53 years.

On July 12th Dr. William Dunn, assistant gynecologist at Johns Hopkins Hospital, was drowned while in bathing with several other physicians. His age was 27 years.

At Baltimore, June 24th, Dr. St. Clair Spruill died at his home from septic bronchitis, aged 49 years.

At Baltimore, June 21st, Dr. Samuel J. Windsor died at his home, aged 52 years.

MISSISSIPPI.

The State Board of Health, through its Secretary, Dr. E. H. Galloway, states that in 1914 10,954 cases of pellagra were reported to the State Board through the county health officers. The number of deaths it caused was exceeded only by those from tuberculosis and pneumonia. The dietary treatment is offered as the most promising, but medication is also necessary.

At Vicksburg pellagra is causing considerable uneasiness on account of the lack of facilities for caring for the patients.

At Ocean Springs Dr. H. B. Powell has been elected President of the Ocean Springs Country Club.

Deaths.

At Ripley, July 12th, Dr. John C. Murray died at his home, aged 80 years.

On July 26th Dr. W. R. Elgin, Ruleville, was killed instantly by falling from a third floor window to the sidewalk. The window sill was level with the floor and a small table was found overturned by its side. His age was 33 years.

At Woodville, July 13th, Dr. J. P. Casey died at his country home after a brief illness.

At Meridian, June 29th, Dr. W. J. Bailey, of Laurel, died at the home of his son, aged 76 years.

NORTH CAROLINA.

At Raleigh the County Board of Health has ordered that no child be admitted to the public schools who has not been successfully vaccinated.

In Iredell County free vaccination against typhoid fever is offered to all citizens. Two free dispensaries were opened and 130 took the treatment in the first hour. In Halifax County 2,146 persons were vaccinated by August 8th.

In Raleigh all Boy Scouts are required to take the treatment before they are permitted to "go camping."

At Asheville, Dr. D. E. Sevier, County Health Officer, estimates that during the anti-typhoid campaign in Buncombe County approximately 3,800 persons received the treatment.

Deaths.

On July 12th, Dr. Thomas S. Burbank died at his home in Wilmington, aged 60 years.

On June 20th, Dr. William W. Wilhelm, of Eufaula, died at a sanitarium in Statesville, aged 78 years.

On July 1st, Dr. E. A. Sherrill died at his home in Statesville, aged 29 years.

SOUTH CAROLINA.

The State Board of Medical Examiners held their examinations in June. Thirty-two applicants for license to practice medicine were successful. Quite a number of applicants for the position of Registered Nurse were also given their certificates. The Board of Medical Examiners consists of eight members, of whom Dr. Harry H. Wyman, of Aiken, is chairman.

At Charleston the board of health has established very rigid rules and regulations for the supervision of the manufacture, subsequent handling, and sale of ice cream in the city. Copies of the rules were distributed to all local dealers

(Continued on page xxvi.)

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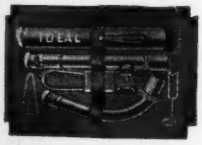

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(Continued from page xxiv.)

in frozen milk products and complete compliance is exacted.

Deaths.

On July 4th, Dr. Charles U. Shepard, known as the "father of the tea industry in America," died at his home in Summerville, aged 71 years.

TENNESSEE.

It is estimated that 16 per cent of the entire population of Nash County have received the full three immunizing doses against typhoid fever. By July 22nd the number of doses given had reached 16,236.

In Chattanooga it is claimed that in the past six months there have been but ten cases and two deaths from typhoid. Health officials warn people against drinking unboiled water from local wells or springs.

The appearance of new cases in August caused an increased demand for the immunizing vaccinations.

Three suits, aggregating $15,000, were filed against Dr. J. H. Atlee, in August, as the result of an automobile accident.

In Nashville, during the week from August 8th to 14th, free pellagra clinics were held at the city hall under the supervision of Dr. W. E. Hibbett, city health officer.

Deaths.

At McMinnville, June 27th, Dr. J. M. C. Burger died at his home, aged 78 years.

TEXAS.

August 6th will be known as "Pellagra Friday" in Dallas County medical circles in memory of the special attention paid to that day in 1915. A clinic was held at the Baylor Medical College at Dallas in which the entire County Medical Society participated. A commission composed of a number of the most prominent physicians in the county was appointed to study the disease.

Dr. J. O. McReynolds resigned his membership in the City Board of Health of Dallas, July 9th.

The Dallas Polyclinic Postgraduate Medical School elected the following officers: President, Dr. John S. Turner; vice-president, Dr. M. E. Tabor; secretary, Dr. S. E. Miliken; treasurer, Dr. J. H. Smart.

Dr. William W. Herring, secretary of the Board of Health of San Antonio, has written a form letter to real estate dealers calling upon them to assist in the city's health survey.

At San Antonio, physicians believe they have discovered a case of sleeping sickness. The patient was a Mexican boy aged 7 years who had been asleep for over a week and could not be aroused. The final result has not been reported.

In San Angelo, in July, fire destroyed the residence and household effects of Dr. T. K. Proctor, 209 West Beauregard Avenue. The house and furniture were partially insured.

According to Dr. W. A. Davis, secretary of the State Board of Health, who made a tour of investigation during June, pellagra is prevailing extensively in the southern portion of the state.

Sabine parish has appropriated $500 for the purpose of fighting pellagra. It is reported that there are 1,000 cases in the parish.

Dr. B. L. Arms and Mr. Fletcher Davis have returned to Austin from a visit to Crystal City, Zavalla County. They report the town and country over-run with rats. They were told that about six weeks before their visit a large number of rats died from some unknown disease, but though they killed thirty-seven, they found no trace of any sickness.

Deaths.

At Marshall, July 7th, Dr. J. H. Taylor died at his home, aged 64 years.

At Mercedes, July 4th, Dr. Edward C. Schoonmaker died at his home aged 43 years.

At Gunter, July 2nd, Dr. John S. Meeks died at his home.

VIRGINIA.

At Richmond early in July the State Board of Health elected the old members of the various boards of health in the different counties. The board confirmed the appointment of Dr. Roy K. Flannagan as assistant health commissioner to succeed Dr. Allen W. Freeman, resigned.

At Petersburg, July 22nd, the Inter-Hospital Medical Conference, composed of the superintendents and assistant physicians of the several Virginia state hospitals and the epileptic colony, held its second semi-annual meeting at the Central State Hospital. The visitors were the guests of Superintendent Drewry and staff.

At Richmond the Board of Health has decided to suspend for the present the strict enforcement of the rule adopted by that body more than a year ago, requiring all dairy herds to be tested with tuberculin by September 1st. This action was taken on account of the danger of a milk famine if the order were enforced at this date.

Deaths.

At Lynchburg, June 10th, Dr. Herbert O. Forbes died at the home of his brother, aged 37 years.

WEST VIRGINIA.

At Parkersburg, July 6th, the members of the Public Health Council, including Dr. S. L. Jepson, the secretary of the old board, and the recent appointee from the six congressional districts, met to conduct the state medical examinations. There were 44 applicants, 28 of whom were from West Virginia, the remainder from various Southern and central states. The names of the members of the board are: Dr. W. J. Davidson, of Parkersburg; Dr. J. L. Pyle, of Chester; Dr. L. E. W. Golden, of Elkins; Dr. F. F. Farnsworth, of Frenchtown; Dr. L. E. Robbins, of Charleston, and Dr. W. B. Stevens, of McDowell County.

Deaths.

On July 5th, Dr. John A. Reyburn died at his home in Ravenswood from carcinoma of the stomach, aged 46 years.

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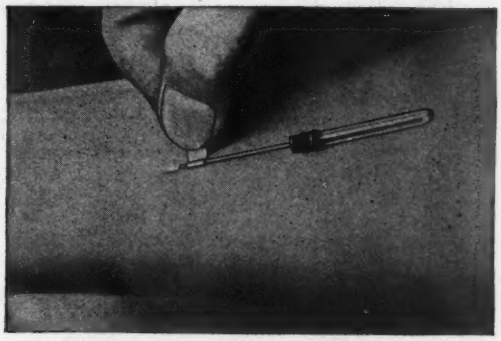
In the Mulford Special Intradermic Test Syringe
A Simple and Accurate Method of Diagnosing Syphilis

Luetin is an extract of killed cultures of a number of strains of the Treponema pallidum (Spirocheta pallida) carefully sterilized and placed in sterile glass ampuls or intradermic syringes.

A positive reaction manifests itself in the form of a pustule, papule, or other inflammation at the site of injection.



Illustrating the Mulford Intradermic Syringe and Method of Testing. Hold needle by finger rest and carefully insert needle **between the layers** of the skin previously sterilized. Push intradermic needle up into the capillary tube and the proper amount of luetin is injected intradermically.

The Luetin reaction is specific for syphilis.

It occurs most constantly and intensely during tertiary and latent stages.

It is usually absent, or very mild, in primary or secondary stages, although in these stages it may become positive after energetic treatment.

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In single test intradermic syringes.
In five-test intradermic syringes.
In ampuls containing 50 tests (without syringes) for hospital use.

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Give one to three ounces every hour or two, according to the age of the baby, continuing until stools lessen in number and improve in character.

Milk, preferably skimmed, may then be substituted for water—one ounce each day—until regular proportions of milk and water, adapted to the age of the baby, are reached.

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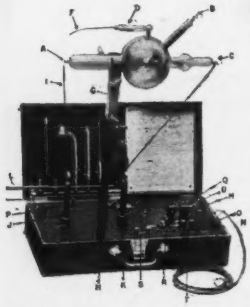

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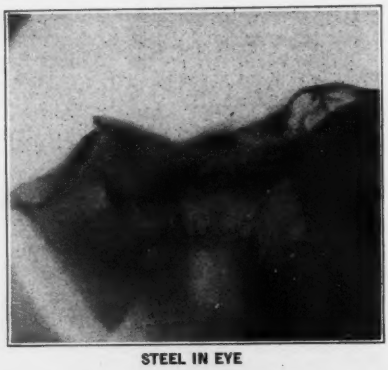

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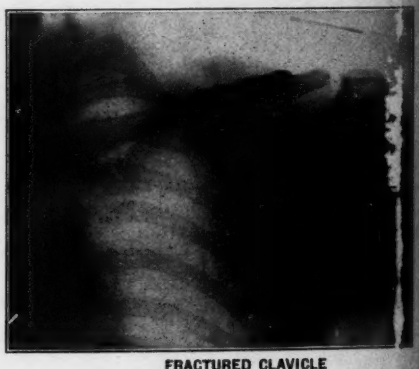

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